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The Macrolepidoptera of the World

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== A systematic description ==
of the known Macrolepidoptera

edited with the collaboration of well-known specialists

by

Prof. Dr. Adalbert Seitz.



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==== I. SECTION: ====

The Macrolepidoptera
of the
Palaearctic Region

IV. Volume: The Palaearctic

Geometrae

by

L. B. Prout.



Introduction.

The *Geometridae* are one of the largest of the families of Lepidoptera, and are distributed throughout the entire world so far as vegetation extends, a few species being found even in the extreme polar regions. It is impossible to estimate at present, even approximately, the probable number of the species. Many new species are found in every extensive collection that is brought from New Guinea, Central Africa, South America, etc., and the better-known faunae are constantly being enriched by the discovery of new forms or especially the differentiation of close allies which had previously been confused together. Ten years ago STAUDINGER-REBEL enumerated over 1230 Palearctic species, although excluding much of the south-eastern part of the fauna; and at about the same time DYAR knew over 800 species as North American. For some other regions, including the enormously rich countries of equatorial South America, no list at all exists, and if such were issued today it would be found exceedingly incomplete tomorrow. There are, however, certain districts in both hemispheres, including, for instance, much of the Argentine Republic, where *Geometridae* are comparatively scarce, or appear to be far outnumbered by representatives of some other families, such as the *Pyrilidae*.

The family is on the whole a very natural one, and except possibly in Australia — where the most ancestral types occur — quite sharply differentiated from all other families. The *Epiplemidae*, the *Polyplocidae* or *Cymatophoridae*, the *Notodontidae* — all of which have been more or less associated with them by one or another systematist — have no really near relation with them. They may be regarded as phylogenetically of rather recent origin, the larvae in particular having reached a very advanced specialization; and like other recent, plastic groups they show a strong tendency to split up into a very large number of closely-allied species (for instance, in the genus *Eupithecia*), some of which are possibly still „in the making“, e. g. *Eupithecia innotata*, *fraxinata* and *tamarisciata*, *E. denotata* and *jasioneata*, *Ectropis bistortata* and *crepuscularia*, some of the South American *Nephodia* (*Nipteria*), etc. Of fossil forms, scarcely half a dozen are known (see Handlirsch, Die Fossilen Insekten), and these are of quite doubtful affinities.

The *Geometridae* are generally recognizable by their build and aspect, apart from any structural distinctions. The comparatively slender body and ample wings, the latter in repose usually partially or almost wholly extended and pressed out flat against the object on which they rest, give them a very distinctive appearance, although occasionally the inexperienced collector mistakes for them certain slenderly-built *Polyplocidae*, *Drepanidae* or the *Epiplemidae*, which share with them the general proportions. The *Pyrilidae* are less often (though still occasionally) confused with them; the very general pearly gloss, differently folded hindwings and long legs of the last-named family are usually sufficient safeguard against the danger of mistake. Some *Geometridae* sit either habitually or occasionally with the wings erected over the back, after the manner of a butterfly — a very rare attitude among the moths in general, except when drying their wings on emergence from the pupa. The genus *Selenia* and several *Larentiidae* (*Hydriomena*, *Ceratotalia*, *Euchoeca* and others) may be cited as examples. Very few indeed close the wings tightly around twigs (*Brephos*, *Alsophila*, *Chesias*, etc.) or round the body after the manner of a Noctuid (*Salpis*, etc.); scarcely any, so far as is known, adopt any very eccentric protective posture (*Zamagra*).

In the struggle for existence the *Geometridae* rely very largely, both in the larval and imaginal stages, on the simpler devices of protective resemblance, which are in most cases (especially as regards the larvae) very beautifully perfected; that is to say, they generally assimilate very exactly, when at rest, to their natural inanimate environment, and very seldom resort to warning coloration or to mimicry of nauseous or dangerous insects or other living creatures.

The larva is almost invariably specialized by the loss of the three anterior pairs of ventral claspers, only those on the sixth abdominal segment and the anal pair persisting. It has been suggested that by this form (which is nearly always accompanied by a great elongation of the middle segments) the creature acquires a longer reach among its foodplant, whether for obtaining more food with an economy of movement, or for passing from twig to twig, or from branch to branch, in its arboreal habitation; it is significant in this connection that a very large percentage of the species in this family, as compared with most of the others, inhabits trees or shrubs rather than low growths. It has also been suggested that the peculiar „looping“ gait which results, and which has gained for the larvae the popular English name of „loopers“, and for the family that of Geometers (ground-measurers) is favourable to rapidity of locomotion. Be this as it may, it is certain that many of the larvae have been enabled to assume a most wonderful likeness to twigs. The food-plant is grasped firmly with the prolegs, the body rigidly extended at an angle, the true legs and head closely tucked together, while there are sometimes also characteristic sharp bends in the body. In addition, to enhance the resemblance, there are often small humps suggesting nodules, leaf-buds or other excrescences of the twig. In such a posture the larva will remain absolutely motionless for many hours, and it is often extremely difficult for even the practised eye to discover it. The absence of the middle legs, however, is by no means restricted to the twig-like larvae, but is virtually, as has been indicated above, a family character. Many are leaf-green in colour, and rest along the midrib of a leaf. Some (notably *Eupithecia*) are flower-feeders, and show a marvellous adjustment to the coloration of the flowers which they inhabit. In the case of the polyphagous ones there is consequently a wide range of colour variability; and it is certainly possible in some cases (I have myself tested it by transferring *Eupithecia absinthiata* from Eupatorium to Senecio) to bring about complete colour changes within the life of a single larva. Similarly with the simply dimorphic larvae (which have a green and brown form to assimilate to different twigs) POULTON and others have demonstrated that a change of colour can often be brought about by a change of environment. Nor must mention be omitted of the fact that some larvae in the ordinary course of their life-history undergo a change to correspond with that in their food plant; *Hipparchus papilionaria* is a well-known example. In some larvae, again (as *Cleorodes lichenaria* or the Australian genus *Declana*), the resemblance is to lichens, and some of the twig-like larvae (as *Gonodontis bidentata*) produce, under favourable environment, perfectly lichen-coloured aberrations.

Very few known Geometrid larvae are protected by passing their lives in literal concealment, scarcely any, apparently, hiding below ground or feeding in roots, like many Noctuids. A Californian species, *Mesoleuca implicata* is said to have quite the same habit as the Palearctic *Agrotis ripae*, burying itself in the sand beneath its food-plant, *Abromia latifolia*. A few *Eupithecia*, *Perizoma*, etc., live concealed in the seed-vessels on which they feed, or commence life thus (or burrowing into buds) and only assume the external habit at a later stage. Other Larentiids (as *Hydriomena*, *Eulype*, *Operophtera*) spin together leaves, residing in the domicile so formed. Certain *Hemitheinae* (*Euchloris*, *Synchlora*, the large genus *Comibaena*, etc.) clothe themselves with fragments of leaves or flowers, without, however, making actual cases as do the *Psychidae* and others.

In more aggressively defensive arrangements, such as poison-glands or urticating hairs, or even terrifying markings or attitudes, the Geometrid larvae are generally altogether deficient. Most are, however, provided with a fluid secretion, usually of a dark green colour, which they discharge from the mouth when attacked and which, although perfectly innocuous to man, is no doubt of some service against certain of their enemies. Some species, such as the common European *Lithina petrarum*, when touched drop to the ground and throw themselves about with the most violent contortions.

The coloration of the moths is also as a rule closely adapted to the surroundings among which they rest by day. Many sit with wings outspread on tree-trunks, fences or rocks, and are of sombre brown or grey tints or coloured like the lichens. It is noticeable that those which, while frequenting such situations, are least perfectly concealed (chiefly *Larentiinae*) are extremely wary, flying off briskly on the approach of danger, and these possibly owe their safety quite as largely to this cause as to the other (assuming that their enemies are things that creep rather than things that fly); but there is no doubt that even in these cases a general adaptation to the environment gives them a good deal of security at rest, and saves them from the constant necessity of fleeing from place to place. Many examples among the Palearctic species of *Larentia* (sens. lat.) will occur to the field-naturalist, of species which, although fairly conspicuous when actually looked at upon the trees, yet on account of the broken outlines created by their markings harmonize quite sufficiently well with their surroundings to be really inconspicuous to the casual passer-by; such are *picata*, *truncata*, *blomeri* and many others. The moths which sit among leaves are often of a beautiful green (the subfamily *Hemitheinae*, with only a few exceptions) or of rich golden brown hues assimilating to the withered leaves; but often the white ones (such as the *Deilinia* group, some *Acidalia*, etc.) are almost as well protected in such situations on account of the suggestion of bird-droppings, or occasionally of white flowers. But indeed the subject of these cryptic adjustments is a limitless one, and almost every separate species is worthy of separate study in relation to its environment.

Many species of *Geometridae*, however, are true day-fliers, and many others are so easily disturbed by day as almost to give the impression that this is their natural time of flight. In the alternations of bright light and shadow caused by the sunshine among trees or undergrowth, black moths like *Odezia atrata* or black-

and-white or latticed ones like *Eulype hastata* or *Chiasmia clathrata* are, according to experience, very difficult to see, and thus, no doubt, sufficiently escape danger without the aid of a powerful flight, which is possessed by very few indeed of the family. Some gorgeously-coloured exotic genera which certainly fly by day, such as *Milionia*, *Dysphania*, etc. are probably more or less distasteful, but we know of no sufficient observations or experiments on this question. The flaunting, crudely-marked „*Abraxinae*“ of Japan and China (*Obeidia*, etc.) are certainly so, and no doubt advertise themselves by their conspicuousness. Concerning *Milionia* its flight is quite unlike that of an ordinary Geometrid; it shoots away very quickly when disturbed and does not settle at once.

There are few true *Geometridae* which enter into mimetic associations. The *Dioptidae*, which have sometimes been placed among *Geometridae*, are proved both by the larvae and some structural characters in the imago to be entirely distinct from them. The African group of *Aletis*, however, certainly enters into the Müllerian mimetic group of *Danaida chrysippus*, etc., and there are other scattered instances of the phenomenon in the faunae of New Guinea, tropical America, etc., which will be noticed in their places.

Owing to the arboreal habits of so many of the larvae — which enable them to be beaten from the branches even when they are too well protected to render searching profitable — and to the fact that captured females will as a rule deposit their eggs much more freely than those of many other families, the early stages of a very large proportion of the Palearctic species are already well known, and even in the other regions a good beginning has been made, although unfortunately in too many cases no descriptions whatever have yet been published. Apart altogether from the biological value of this method of work, breeding is one of the best methods — probably the very best — of obtaining material in this family. So many of the species are fragile and easily rubbed that it is very difficult to procure captured series in good condition. The eggs are often laid quite readily on the sides of the box in which the ♀ is confined, but in many cases the insertion of a sprig of the foodplant is a great incentive; in others a preference is shown for very fine rootlets, or shreds of frayed string.

The larvae for the most part feed on fresh leaves, but the species of *Acidalia* and some of their allies prefer withered or even mouldy food; one species, *Ptychopoda ptelearia*, sometimes does considerable mischief in herbalists' shops or in herbaria. As a rule, Geometrid larvae are not at all difficult to rear; and the frequent wide range of variability of the moths, especially in the temperate and sub-arctic regions, renders them peculiarly fitting subjects for various kinds of scientific investigation, whether into the working of the laws of heredity, the influence of temperature in the production or modification of variation, or the possibilities of hybridisation between more or less closely allied species. Already in Europe good work has been done in all these directions, and its further pursuit both here and in other parts of the world is highly to be recommended. MENDEL'S Law of Heredity has been partially tested, with varying results, in *Gonodontis bidentata*, *Abraxas grossulariata*, *Amphidasis betularia*, *Xanthorhoe ferrugata*, *Ptychopoda virgularia* and others. MERRIFIELD and others have carried out valuable temperature experiments with *Selenia*, *Cosymbia*, etc. Hybridisation has also proved in part possible in the two last-named genera and especially among the *Biston* group.

As regards the range of imaginal variation it is impossible to summarize it within a limited space. Generally speaking, it reaches its maximum towards the confines of geographical distribution. In Iceland, New Zealand and Chili, for instance, the *Geometridae* (in common with other families of the Lepidoptera) vary enormously, while in tropical countries it is comparatively exceptional to find a species very variable. The phenomenon of Melanism seems to be there practically non-existent, whereas in some parts of the north of Europe it is exceedingly prevalent.

Sexual dimorphism is moderately frequent, but seldom reaches any startling manifestation; and much oftener than not, the two sexes are virtually alike in colour and markings, being only distinguishable by structural characters, or by size and perhaps slight differences of shape. The absence of extremes is no doubt due to the general similarity of habits in the sexes and the rarity of true mimicry. Probably the most remarkable examples of this kind of dimorphism are found in the genus *Anisozyga*, which chiefly inhabits New Guinea and North Australia; no theory appears to have been as yet offered to explain its occurrence in this genus, and even here it is confined to some only of the species. The South American genus *Pero* and others and the cosmopolitan *Orthonama obstipata* (= *fluviata*) may also be cited as furnishing some moderately striking examples of this phenomenon. Another phase of sexual dimorphism, in which the ♀ is apterous or semi-apterous, occurs here and there among the Palearctic and Nearctic Geometridae, in the Australian *Zermizinga* and one or two South African species referred by WARREN to *Haggardia*. Probably other examples will be discovered amongst species of which hitherto the ♀ remains unknown; WARREN suggests it as likely in the case of his *Scoria infumata* from Peru. In the majority of instances (*Erannis*, *Alsophila*, *Operophtera*, the *Biston* group and others) this apterous condition is correlated with the appearance of the moths in the leafless winter season, and various theories have been advanced, with greater or less plausibility, to account for this correlation; such as that the large wing-expanse necessary to carry the heavy-bodied ♀ in the stormy winter weather would be a disadvantage to her in the struggle for existence, as rendering her difficult of concealment in the leafless condition of the trees.

Seasonal dimorphism seems to be strangely rare in the tropics; yet it is still possible that some sensational discoveries await us regarding the identity of species hitherto considered distinct, such as have from time to time been made among the butterflies of Africa, for instance, through the careful breeding experiments of

a few naturalists there. From Peru and other parts of tropical South America very extensive collections have of recent years been received in Europe, provided with accurate data as to the season of capture, and yet they reveal scarcely a trace of seasonal variation. In Europe, seasonal dimorphism is well known in the genera *Cosymbia*, *Lythria*, *Ellicrinia* and *Selenia*; but even in this region it cannot be regarded as a very general occurrence.

The habits of the *Geometridae* are about as varied as would be expected amongst so large a family. Information is, however, regrettably deficient as regards the habits of most of the exotic species. Some points have been discussed above, in connection with protective resemblance. As there indicated, the usual time of flight is in the evening or later at night, although during the day they can, for the most part, be rather easily disturbed from their resting-places in the trees, bushes or herbage. In Britain, of which I can speak from personal experience, the favourite time of flight is about sunset or in the early dusk, although a few species (*Abraxas grossulariata*, *Crocallis elinguaris*, *Cidaria pyraliata*, etc.) do not usually become active until towards midnight. The flight is usually rather gentle and not extremely long-sustained; but *Ourapteryx* and a few others dash about more wildly and irregularly. The great majority are provided with tongues and feed more or less at various flowers, flowering rushes or other natural sweets, but are on the whole much less greedy feeders than the *Noctuidae*, and although a long list might be made of the species which have occasionally been attracted by „sugar“, yet they visit it only in quite small numbers, and on many nights do not seem to be attracted to it at all. On the other hand most, if not indeed all, of the species may be attracted by light, and they are usually easily captured in this way. *Eupithecia* and many others do not, as a rule, continue to flutter round long when under the influence of this attraction, but settle down quietly with the wings pressed flat against the glass, or sometimes on some object near by — especially if there be a white wall or ceiling within the radius of the light.

The localities most favoured are the edges of woods or bushy places, or rough broken ground with a wealth of vegetation. Open grass-land is apparently much less productive. A fair number of species, however, reach high altitudes in the mountains and high latitudes in the Arctic Region. Generally speaking, the species which reach the extreme limits seem able — perhaps on account of the comparative absence of competition — to propagate themselves in great abundance, and there are several records of the appearance of a particular species in Arctic Norway or Iceland in prodigious numbers, the air being sometimes filled with them as though there were a snow-storm. The subfamily which thrives best under rigorous climatic conditions is the *Larentiinae*, and it is probable that a previous (even where there is not a present) circumpolar distribution accounts for the fact that the great majority of the species common to the Palearctic and Nearctic Regions belong to this subfamily. It is interesting that a good proportion of the *Geometrid* fauna of the inhospitable Magellan and Tierra del Fuego district and almost all the *Geometridae* we have yet seen from the Falkland Islands belong also to the *Larentiinae*. The *Hemitheinae* and *Acidaliinae*, by contrast, are very poorly, when at all, represented in the extremes of northern and southern latitude.

On account of their comparatively weak flight, there are very few migrants among the *Geometridae*. *Orthonama obstipata* and *Rhodometra sacraria* are the chief examples, and little, if anything, is known as to the means of their dispersal. Occasionally, however, and apparently under the same meteorological influences which prompt the migratory birds, certain common sedentary species migrate in enormous swarms. Thus on Heligoland, in three or four different years, such companies of *Erannis defoliaria* and *aurantiaria* have been observed, always travelling westward; and on at least one occasion thousands of *Ennomos quercinaria*.

The *Geometridae* are of no ascertained value to economic entomology. On the other hand one species in particular, and several others to a lesser degree have to be reckoned among the prominently injurious insects. The outstanding example is *Operophtera brumata*, whose ravages among fruit-trees, and the best means for its destruction, have been discussed in every European work on economic entomology since the Swedish Academy invited essays on the subject in the days of LINNAEUS. Fortunately as its ♀ is apterous, the warfare against this pest is waged under somewhat more advantageous conditions than would otherwise be the case, it being possible to destroy immense numbers on the tree-trunks before they reach the branches. Incredible as it may appear, it is now, however, definitely stated by several independent and trustworthy witnesses, that the ♂ is sometimes capable of carrying the ♀ *in copula*, although one may still venture to doubt whether this is more than a flutter which could scarcely lift her in an upward direction. The larvae of some other species multiply in certain seasons so as to be scarcely less destructive, either to orchards or to forest trees, as the case may be, but it is not necessary to particularize these in this place.

The *Geometridae* are small or moderate-sized (rarely large) moths, usually of slender build. Palpus rarely very strong, third joint scarcely ever with remarkable modifications of shape or scaling. Antenna very variable in form. Thorax rarely strongly crested. Abdomen with basal cavity beneath the pleura of the (much swollen) second segment. Legs seldom very hairy, but ♂ hindtibia often furnished with strong hair-pencil. Forewing usually with four or five subcostal veins, the fourth and fifth (and nearly always the third) stalked together; various forms of anastomosis frequent. Second radial from centre of discocellulars, or above, scarcely ever connate with third radial. First submedian wanting. Hindwing with costal vein making a bend into humeral angle, never connected or anastomosing with subcostal beyond end of cell, second radial never connate with third, often absent, first submedian wanting. Egg flat. Larva a looper, usually with only two pairs of claspers.

Six subfamilies may be distinguished:

1. *Brephinae*. Eye small and oval. Larva 16-legged.
- 2.—6. Eye spherical, nearly always large. Larva almost invariably with less than 16 legs, extremely rarely with more than 10.
2. *Oenochrominae*. Hindwing with all veins, the costal free or connected with cell by bar near base; second radial usually normal. Colour never bright green.
3. *Hemitheinae*. As the preceding, but with second radial arising above middle of cell. Colour usually bright green.
4. *Acidaliinae*. Hindwing with all veins, the costal anastomosing with cell at a point near base.
5. *Larentiinae*. Hindwing with all veins, the costal anastomosing strongly with cell, or rarely in ♂ connected with it by a bar beyond middle.
6. *Geometrinae* (= *Boarmiinae* auctt.). Hindwing with second radial wanting or vestigial.

1. Subfamily: Brephinae.

A very small, somewhat isolated subfamily occurring only in the Palearctic and Nearctic Regions, its nearest relative probably the Australian genus *Dirce*, belonging to the *Oenochrominae*. Head, thorax, abdomen and legs strongly hairy. Eye small, oval. Forewing with third and fourth subcostals coincident, or only separating near apex. Hindwing with second radial weak or obsolescent.

Only two genera are known, both represented in the Palearctic Region.

1. Genus: **Brephos** Zinck.

Characters of the subfamily, as given above. Antenna in ♂ either bipectinate with short clavate branches or nearly simple, ciliated. Hindwing with second subcostal usually stalked, first median connate or just separate. — Larva 16-legged, but with the anterior pairs of prolegs weak, a half-looping gait maintained throughout life. Pupates in moss or bark, or in soft wood, in captivity is very willing to burrow into cork. The pupa sometimes lies over two winters. The moths fly in the sunshine in early Spring, and love to keep high about the tops of the trees, though occasionally descending, especially in the later part of the day, to feed at sallow catkins. At rest they clasp the branches closely, and are hard to see, presenting the appearance of knots or buds; but they may sometimes be dislodged by shaking the tree.

B. parthenias L. (1 a). Forewing brown, powdered with shining grey. A grey oval cell-spot, dark-sur-
rounded, reminding of the *Noctuidae*, some costal white marks varying in width and intensity, the proximal
often continued nearly across the wing. Hindwing orange, with large discal spot, the distal margin and most
of the inner-marginal half blackish. Underside of both wings orange, the markings variable. ♀ above with the
white markings generally broader and clearer than in the ♂. — In the ab. *obscura* ab. nov., the forewing is
darkened, almost unicolorous. This form has been figured, but not described or named, by HAVERKAMPF. —
The ab. *nigra* Tutt is a still more extreme form than the preceding, both wings being entirely black.
— ab. *nigrobasalis* Spuler is characterized by having the entire basal part of the hindwing black. — In
ab. *passetii* Th.-Mieg the hindwing is infuscated. — In the var. *sajana* form. nov. from Sajana, Siberia (the
name adopted from the trade lists of STAUDINGER), the tone is somewhat fuller and redder, on the whole weakly
marked, the pale patch proximally to the cell-spot on the forewing broad but short, the spot itself uniformly
dark (not paler-centred as in the type), the cell-spot of hindwing rather small, the wings perhaps slightly shorter
and broader than in the typical form. A single specimen described from Kamtchatka by ALPHERAKY would
appear to be similar to this, but may prove, when material is available for study, to belong to another race, or to
the North American representative species *infans* Möschl. The larvae is green with three darker, finely yellow-
edged dorsal lines, lateral line yellow, spiracles black, tubercles yellow, setae small, black. It feeds on birch in May,
perhaps in some localities also on beech. The pupa is rather smooth, cylindrical, tapering rapidly at anus, cre-
master shorter than broad, not tapering, flat at extremity, the two spines projecting laterally, opposite to one
another; colour shining red-brown, spiracular spots darker. The species is widely distributed in Central and
Northern Europe and in Siberia, where it reaches eastward to Kamtchatka and Amurland. It is not afraid of
the rigour of the Far North, occurring even in Lapland.

B. notha Hbn. (= vidua F. nec Poda) (1 a). Similar to the preceding, rather smaller, ♂ without dis-
tinct white patch proximally to the cell-spot, ♀ with a pale band near base of forewing. Structurally distinct
in the pectinated ♂ antenna (which is simple in *parthenias*) and in the much shorter stalking of the second sub-
costal vein of hindwing. Variation quite inconsiderable; in Central France, on the banks of the Cher, occurs
a small form, *touranginii* Berce, with the forewing slaty grey, its postmedian line little bent, the white patch
following it distinct, the larva said to live exclusively on *Salix monandra*. Larva similar to that of *parthenias*,
but characterized by two irregular black streaks or blotches on the face, prothorax more or less marked with

black dorsally; in the early stages an almost entirely black larva. On aspen, more rarely on sawlow. Pupa quite similar to that of *parthenias*. Europe, Central Asia, Algeria.

puella. **B. puella** Esp. (= *caelebs* Hbn. = *spuria* Hbn.) (1 a). Forewing greyer than in the two preceding, in ♂ usually nearly unicolorous, in ♀ with the central area often broadly pale. Hindwing duller, less reddish, *treitschkei.* usually considerably paler, the dark parts somewhat extended. Structure nearly as in *notha*. — In ab. **treitschkei** ab. nov. (♂) the forewing is very dark brown-grey, with no distinct markings, the hindwing and underside milk-white in those parts which are yellow in the typical form. Recently described, without name, by AIGNER-ABAFI, from coll. TREITSCHKE. — Larva on aspen, violet-reddish with four white longitudinal lines. Range somewhat restricted, Central Europe to South Russia.

2. Genus: **Leucobrephos** Grote.

Somewhat more robust than *Brephos*, and even more shaggy. Antenna in ♂ more strongly bipectinate. Tibial spurs minute. Cells very long, yet with the first median vein of hindwing long-stalked. Early stages unknown. The only two known species of the genus are very closely allied, if not indeed forms of a single species. They are scarce in collections, and seem to be almost confined to high latitudes in Siberia and North America, though the American species, *brephoides* apparently reaches further southwards in the Rocky Mountains.

middendorffii. **L. middendorffii** Mén. (1 a). Only known to me from Ménétériés' description and figure (here copied). Is possibly not specifically distinct from *brephoides*. Forewing blackish grey, the lines black, the proximal outcurved behind cell, the distal outcurved in middle, then incurved, followed by a white band. Hindwing white, with a narrower dark border than *brephoides*. Underside with more white. N. E. Siberia.

2. Subfamily: **Oenochrominae**.

A rather unsatisfactory subfamily, created by MEYRICK to contain the various genera — not all closely related — which have maintained the most nearly the primitive Geometrid venation, all the veins of the hindwing being present but without the specializations characteristic of the *Hemitheinae*, *Acidaliinae* or *Larentiinae*. In Australia, where it is most strongly represented, it is perhaps a comparatively natural subfamily, but it is doubtful whether the few isolated Palearctic genera which are necessarily — in the present state of Geometrid classification — referred to it have any really close affinity with the Australian, or with one another. Excepting the venational character, there is little by which the subfamily as a whole can be characterized. Very frequently the ♂ antenna is unipectinate, but this does not occur in any of the Palearctic forms. The *Orthostixinae*, recognized by MEYRICK and HAMPSON as a separate subfamily, distinguishable by the presence of a bar between the costal and subcostal veins of the hindwing, near the base, has not proved tenable; even in the genus *Orthostixis* itself, this may be either present or absent. Several of the species fly by day, but the habits are almost as diversified as the structure. A few of the larvae have more than the normal number of prolegs, but none are at present known which possess the full complement like the *Brephinae*. Scattered representatives of the subfamily (as at present constituted) are distributed nearly throughout the world.

1. Genus: **Alsophila** Hbn.

Palpus very short. Antenna in ♂ with long fasciculate ciliation. Hindtibia with all spurs. Wings of ♂ thinly and smoothly scaled, ample, but at rest closely folded. Second subcostal vein of forewing usually free. Hindwing with cell long, costal vein anastomosing strongly with subcostal, second radial variable in position, sometimes arising remarkably near third, third submedian unusually long, running to anal angle. ♀ apterous, with strong anal tuft. — The eggs are laid in batches, firmly cemented, often encircling a twig after the manner of *Malacosoma neustria*, and are covered with hairscales from the maternal anal tuft. The larva is slender, smooth, cylindrical, with a pair of rudimentary prolegs on the fifth abdominal segment which, according to BREYER, are tactile, not prehensile. The pupa is plump, with eyecases prominent, abdomen tapering rapidly, anal extremity armed with two short, divergent spines; enclosed in a moderately compact earthen cocoon. The genus is chiefly Palearctic, one species, however, being North American.

They appear in the late autumn or early spring and are often very abundant. The larvae are tree-feeders, and the American species is reckoned among the injurious insects. The genus is very generally called by the younger name of *Anisopteryx* Steph.

A. aescularia Schiff. (1 a). Forewing pale brownish grey, darker dusted, with two dentate dark *aescularia*. lines, the first bounded proximally and the second distally by ill-defined pale bands. Hindwing paler, with prominent discal spot and weak dentate line. Under surface similar, rather paler. Usually very constant in colour and markings, though occasionally unimportant darker aberrations are met with. — In Japan and S. E. Siberia represented by *japonensis* Warr. (1 a) which is somewhat ampler-winged, duller and less sharply *japonensis*. marked, and differs structurally in having the discocellulars of the hindwing simple, with the second radial from near the centre, whereas in *aescularia* they are biangulate, with second radial from near third. — *urz-humaria* Krulik. from E. Russia is founded on a large, greyer specimen, with rather well-marked transverse bands, and may perhaps prove to be a local race of either *aescularia* or *japonensis*. Larva pale green, with faintly darker dorsal lines, yellowish subdorsal and spiracular lines and black spiracles. Recalls that of *Operophtera brumata*, but is somewhat more slender, and easily known by the minute prolegs (or processes) on the fifth abdominal segment. Feeds on most trees, with perhaps a preference for the common elm. The ♂ sits by day on fences or tree-trunks or among dead leaves, the hindwings closely folded and the forewings placed one over the other in a position almost unique among the *Geometridae*. It flies along hedges at dusk and is strongly attracted by light. The typical form occurs chiefly in Central Europe, but extends to Castile in the south-west, Scotland and southern Scandinavia in the north and Russian Transcaucasia in the south-east.

A. quadripunctaria Esp. (= *aceraria* Schiff. nec Hufn., *mellearia* Scharfenb.) (1 b) is of a browner colour *quadri-punctaria*. than the preceding species, the lines more indistinct, not white-margined, the hindwing whiter with the line obsolete. Larva greenish, with greenish-white dorsal and yellow lateral lines, feeds on various trees. The imago occurs in the late autumn, and has a similar range to the preceding, but is wanting in Britain and has no Oriental representative. The species has long been known as *aceraria*, but this is a homonym and therefore untenable.

A. tenuis Btlr. (3 a) Forewing of ♂ much stumpier than in the preceding species, and with some *tenuis*. slight differences in neuration which would possibly justify the retention of the generic name *Inurois*, under which BUTLER described it. Colour brownish- or purplish-grey, thinly scaled, the scheme of markings nearly as in the two preceding, the postmedian line not, or not appreciably bent near costa. Discal dots somewhat variable, usually very small, never very large or black. ♀ unknown. The species is only known as yet from Japan, and its exact range there is not ascertained. The only specimens before me with precise data are from Yokohama.

A. membranaria Christ. (3 a) is closely related to the preceding, but the ♂ is on an average larger, *membranaria*. is considerably paler and has extremely prominent black discal spots on both wings, that on the forewing being very large. The ♀ possibly lacks the anal tuft of true *Alsophila*, but I have only seen one worn specimen. Occurs with the preceding species at Yokohama, but also in S. E. Siberia.

2. Genus: **Phthorarcha** Meyr.

Nearly related to the preceding genus, distinguished by the narrower wings, the longer stalking of the second subcostal of the hindwing, and especially the absence of median spurs. — Of the life-history and habits nothing is as yet known. The single species has a limited range in Turkestan.

Ph. primigena Stgr. (1 b). ♂: forewing pale brownish grey, with two very faint dentate lines, the distal *primigena*. incised near costa; cell-spot very weak, elongate; a brown streak from apex. Hindwing whitish, with obsolescent cell-mark. Underside of forewing paler, costal end of distal line present. ♀ apterous, with strong anal tuft. Zerafshan to perhaps the Transcasian region. Has been erroneously recorded by LEECH from Japan, his specimens having been really *Alsophila japonensis*.

3. Genus: **Egea** Dup.

Small moths with the wings (especially the hindwing) rather elongate, in the ♀ narrow and ill-developed, scaling nearly as in the two preceding genera. Palpus short. Antenna in ♂ bipectinate, typically with long branches. Hindtibia with all spurs well developed. Forewing with cell long, second subcostal absent. Hindwing with R^2 weak, thus somewhat transitional towards the subfamily *Geometrinae*. — Early stages apparently unknown. The species are distributed in the eastern half of the southern Palearctic Region.

culminaria. **E. culminaria** *Eversm.* (= *desertaria* *Frr.*) (1 b), the name-type of the genus, has a light grey-brown ground-colour, much mixed with white, the usual lines on the forewing represented by strong dark spots or dashes on the veins, the distal area white, interrupted with brown on the veins. The hindwing is weakly marked, with an ill-defined white median band. Underside similar, but rather paler. Early stages apparently unknown. The moth was originally discovered flying in May at high altitudes in the Ural district, but extends to Western Turkestan.

teneraria. **E. teneraria** *Stgr.* (= *coelestinaria* *Alph.*) (1 b) has the grey-brown ground-colour much less mixed with white than in *culminaria* and lacks the dark spots or dashes on the veins. The most conspicuous white band of the forewing is beyond the middle, projecting strong teeth proximally; the distal white spots are reduced, the brown band preceding them broader. Antennal pectinations much shorter than in *culminaria*. Only known from a few localities in Eastern Turkestan.

pellucida. **E. pellucida** *Stgr.* is distinguished from the other species by its somewhat broader, more transparent, very weakly-marked wings. The ground-colour is smoky grey or smoky brown, with a nearly obsolete narrow dark band running from the costa of the forewing at three-fourths and very faintly continued on the costal part of the hindwing. Antennal pectinations strong. Discovered by ELWES in the south-eastern Altai.

cacuminaria. **E. cacuminaria** *Ramb.* (1 b) differs from *culminaria* in its larger size, much darker forewing with slightly rounder costa and reduced distal white spots, distinct discal spot on hindwing (not shown in the figure), slightly less long antennal pectinations in the ♂ and longer stalking of second subcostal vein of hindwing. Andalusia to Aragon.

argentaria. **E. argentaria** *Bang-Haas* is described as agreeing with *cacuminaria* except in the silvergrey ground-colour, sprinkled with brownish, the pure white-grey distal area, the terminal line consisting of long black streaks instead of dots, the hindwing without discal spot, marginal dots or distinct band. Tunis: Fom-Tatahouine. Unknown to me in nature.

planaria. **E. planaria** *Chrét.* Also described as near *cacuminaria*, and also unknown to me. Possibly a form of the preceding, but distinctly stated to possess a well-marked dark discal spot and terminal blackish line to the hindwing, which is grey with a whitish postmedian band. Said to differ chiefly from *cacuminaria* in having no discal spot on the forewing, a distinct median shade on the costa and the median and submedian veins white. Tunis: Gafsa.

4. Genus: **Myinodes** *Meyr.*

Palpus moderate or rather long. Antenna in ♂ with fascicles of even cilia. Legs rather slender, hindtibia with four rather long spurs. Abdomen slender. Wings glossy, smooth-scaled, in ♀ rather narrower than in ♂. Forewing with first subcostal anastomosing with costal vein, second subcostal anastomosing with first and with third and fourth. Hindwing with second subcostal stalked. — Early stages unknown. The single species is almost confined to the Mediterranean littoral. STAUDINGER calls the genus *Eusarca* *Her.-Sch.*, a preoccupied name.

interpunctaria. **M. interpunctaria** *H.-Sch.* (1 b). Forewing pale grey-brown, sparsely dark-sprinkled, veins very finely whitish, broader longitudinal stripes between the veins, the dark lines indicated by teeth on the veins, cell-spot and small dots on distal margin black. Hindwing whitish, postmedian line indicated by spots on the

veins. Underside of hindwing less white, more concolorous with forewing, more strongly marked than above. Murcia, Tunis, Sicily, Syria, N. Mesopotamia.

5. Genus: **Uliolepis** Warr.

Face and palpus hairy. Tongue wanting. Antenna in ♀ bipectinate (♂ unknown). Thorax densely hairy. Abdomen robust. Cells long, discocellulars biangulate, second radial arising from posterior angle, therefore near third. — Early stages unknown. Belongs to quite a different section from the preceding genera, and would possibly be better associated with the *Biston* group in the *Geometrinae*, but the second radial of the hindwing is well developed.

U. pilosa Warr. Forewing ochreous grey, dusted with blackish. Lines blackish, excurved anteriorly, *pilosa*. incurved posteriorly, consisting of a basal, an antemedian and a postmedian, besides a median shade. Discal mark large, diffuse, grey. Hindwing paler, without markings, except an indistinct curved submarginal shade. Under surface much paler, unmarked. Wing-expanse 34 mm. The unique type, a ♀ from Sefir Kuh (Sefid Kuh?), Afghanistan, in coll. ROTHSCILD, is unfortunately in very bad condition, and it has not been possible to figure it.

6. Genus: **Sarcinodes** Guen.

This genus, very distinct from all the Palearctic *Oenochrominae*, belongs essentially to the Indo-Australian fauna, and will be described in Vol. 12, and figured there on Pl. I of that Volume, but is mentioned here because two of the species have straggled as far as the confines on the Palearctic Region. It may be distinguished by its large size, powerful build, unipectinate ♂ antenna and by having the second radial of the hindwing connate or even very shortly stalked with the first.

S. restitutaria Walk. Ochreous reddish with purple reflections, especially in distal area of forewing *restitutaria*. and median of hindwing (occasionally more purplish all over). A nearly straight, double olive-fuscous line from close to apex of forewing to middle of inner margin of hindwing, enclosing a fine pale line. Underside paler, more pinkish, with a dark line much nearer base, and a line of dots beyond. Borneo to India, Omei-Shan.

S. aequilinearia Walk. Lilacine, usually much shaded with reddish. Forewing with three, hindwing *aequilinearia*. with two nearly straight, oblique, equidistant darker reddish lines, the distal one shaded with yellow proximally. Costal edge and fringe also dark reddish. Under surface with distal half much more variegated with yellow and reddish-orange, only the median line present, shortly followed by an irregular line of dark vein-dots. N. India, Omei-Shan.

7. Genus: **Epirranthis** Hbn.

Face smooth, palpus short. Antenna in both sexes slender, nearly simple. Thorax moderately hairy. Hindtibia with all spurs. Wings ample, thickly scaled. Forewing with distal margin bent in middle, first subcostal anastomosing with costal vein, second subcostal with first and then with third to fourth. Hindwing with second subcostal arising from cell. A quite isolated genus in Europe, its nearest relatives — so near, indeed, that MEYRICK has referred them to the same genus — being the New Zealand genera *Xyridacma* and *Xynonia*.

E. diversata Schiff. (= *pulverata* Thnb., *aurantiata* F.) (1 b). Forewing light red-brown, dark *diversata*. dusted, lines weak, chiefly indicated by black spots on the veins, and by a paler (at costa broad and ochreous-whitish, afterwards narrow and glaucous) shading which accompanies the first line proximally and the second distally; the second oblique in anterior half of wing. Hindwing orange, coarsely dusted with fuscous. Both wings with very large blackish discal spot. Under surface of forewing orange, of hindwing paler, both wings strongly sprinkled and marked with fuscous, the discal spots as above. Local in Europe, excepting the west and south. — The var. (ab.?) **pallidaria** Wendlandt, described from four ♂♂ from Wiesbaden, is much *pallidaria*. paler, less dusted, the lines obsolescent. — The egg has been described by V. RICHTER and is ellipsoid, dark orange to flesh-colour, the micropylar pole flattened, pattern hexagonal, a micropylar rosette of 6 to 10 cells. Larva slender, cylindrical, eighth abdominal segment with a transverse protuberance; colour grey, with two lighter dorsal lines and dark grey dorsal spots, the tubercles large, black. Feeds on aspen in May and June. Pupa rather slender, cylindrical, cremaster short, terminating in two crossed spines and on either side two or three hooklets. The moth appears in March and April, flying about the tops of trees in the sunshine in company

with *Brephos*, to which its general similarity in colouring must be due more to convergence than to near relationship.

8. Genus: **Aplasta** Hbn.

Palpus moderate, rather rough-scaled. Antenna rather thick, tapering, in both sexes nearly simple. Hindtibia with all spurs. Wings broad, rather thickly scaled; frenulum wanting. Forewing with first subcostal anastomosing with costal, second wanting. Hindwing with cell rather short, second subcostal stalked, second radial arising above the middle of the discocellulars, as in the *Hemitheinae* (to which at one time MEYRICK referred the genus). This is another isolated genus, consisting of a single species of which no near relatives are known.

- ononaria*. **A. ononaria** Fuess. (= *rubellata* Vill., *rubicapraria* Hbn.) (1 c) is a variable species in colour and in the distinctness of the markings, which are never sharp and consist merely of a somewhat darkened line or shade on both wings beyond middle, a very faint pale submarginal line, occasionally faint traces of an antemedian line on forewing only, and occasionally very faint traces of a cell-spot on both wings. The under surface is more heavily dusted, the markings more distinct. In the typical form (1 c) the ground-colour is yellowish brown, moderately irrorated with reddish. — **rubraria**, *ab. nov.* (1 c) is darker and redder, the irroration in part fuscous, especially on hindwing and underside. Specimens have been circulated under this name by the firm of STAUDINGER. — *ab. sudataria* Hbn. is an unimportant aberration of smaller size and rather strongly marked. *faecaturia*. — **faecaturia** Hbn. (1 c) is a summer form recorded chiefly (through not exclusively) from the eastern part of the range of the species and characterized by smaller size, paler ground-colour and more noticeable red markings. *berytaria*. — **berytaria** Hbn. (1 c) is an almost unicolorous greenish-grey aberration or variety from Syria and the southern Taurus. — The larva feeds on *Ononis* in the spring and again about July, and assimilates beautifully to its food-plant. It is rather short and stout, fusiform, with small conical head, the body green, a lateral line yellow, the tubercles small, but dark, the covering of hairs unusually conspicuous for a Geometrid larva. The pupa is moderately stout, greenish, vestigial tubercles distinct, nearly black, bearing rather stiff setae, cremaster strong, with eight well-developed hooks; enclosed in a slight cocoon. The imago is double brooded, appearing normally in June and August. It occurs commonly in places, but is local, in southern and central Europe and eastward to Armenia.

9. Genus: **Heliothea** Bdv.

Palpus moderate or rather short, with long rough hairs. Tongue weak. Antenna rather short, in ♂ with rather long to moderate, in ♀ with very short pectinations. Legs rather short. Hindtibia without median spurs. Frenulum wanting. Wings rather strong, well scaled. Forewing with first two subcostals long-stalked, connected very shortly with costal. Hindwing with second subcostal short-stalked, second radial arising above the middle of discocellulars. Like the preceding genus, the present one shows some affinity to the *Hemitheinae*, but the two have evolved along rather widely different paths. The larva of the type species has been made known by Millièrè, and is briefly described below. The genus apparently consists of only two species, the eastern one somewhat variable, or inclined to form local races.

- discoïdaria*. **H. discoïdaria** Bdv. (1 c). Head and body with antenna, etc. almost entirely black. Tegulae and wings bright golden yellow, the wings blackish at margins and each with a large, round, black discal spot. Larva nearly cylindrical, without protuberances, slightly attenuated at the extremities, head small, spherical, coralliform, distinct from prothorax, tubercles small, setae minute, ground-colour greyish or bluish green, dorsally washed with orange. Head pink. Feeds on *Santolina*. Hibernates as larva, spending about 10 months in the larval stage. Pupa cylindrico-conical, smooth, anal extremity obtuse, with several small hooks; in a slight cocoon. The moth flies in the sunshine and is very local, and known only from some parts of Spain. It emerges towards the end of May or in June.

H. iliensis is very distinct from the preceding in its much paler colour, with usually duller forewing, and in the absence of black margins and large discal spots. Structurally, too, the relationship is not very close, the present species having broader forewing, shorter antennal pectinations, more oblique discocellulars, with second radial rising further above the middle. It suggests in some respects an intergrade towards the African genus *iliensis*. *Petovia*. In *iliensis* Alph. (1 c), the first described form, which is distributed in Turkestan, the forewing is pale

clay-colour, the hindwing yellow. — In the form *alpherakii* Stgr., which occurs in the Zerafshan and Fergana *alpherakii*. districts, both wings are yellow, the forewings with costa, fringes and a discal spot grey, thus more nearly approximating to *discoidaria*. — *herzi* Stgr., from one or two localities in Zerafshan, is smaller, the forewing wholly *herzi*. grey, the hindwing orange with a grey border. — *christophi* Alph., described from a single ♂, and unknown to *christophi*. me in nature, is said by STAUDINGER to be probably an abnormal aberration of *iliensis*. The forewing above and hindwing beneath are whitish-ashy, the hindwing above and forewing beneath grey. Near Kuldja.

10. Genus: **Odezia** Bdv.

Face with projecting scales. Palpus moderate, rough-scaled. Antenna rather short, in ♂ shortly and evenly ciliated. Hindtibia with all spurs. Forewing with first and second subcostals stalked, second often anastomosing with third to fourth. Hindwing with cell short, costal vein closely appressed to the cell to nearly its end, second subcostal stalked. This is again an isolated genus. The older systematists classed it with the *Larentiinae*, and it certainly seems to show some signs of affinity therewith, but not sufficient to allow of its being classified among them. Its supposed close relationship to *Baptia tibiale* is almost entirely fictitious. The single species has a wide range in the Palearctic Region.

1. *O. atrata* L. (= *chaerophyllata* L.) (1 c). Almost entirely black, the extreme apex and apical *atrata*. fringe of the forewing white. — In *pyrenaica* Gump. (= *costai* Calb.), from the Pyrenees and Central *pyrenaica*. Italy, the wings, but especially the forewing, are more or less strongly dusted with brownish-yellow. — In *ab. nigerrima* Th.-Mieg, described from a single ♀ without exact locality, the white apex and apical fringe are absent. *nigerrima*. — The life history has been fully worked out by CHAPMAN. The egg is unlike any other yet described in the possession of two remarkable sulci, one on each side, running nearly from end to end and giving the aspect, when only a single face is considered, of a grain of wheat. It is laid in the summer and does not hatch until the following spring. The larva feeds on *Conopodium denudatum* (*Bunium flexuosum*), perhaps occasionally on other allied plants. It is long and slender, nearly cylindrical, without protuberances, green in the first and second instars, either green or brown in the third and fourth. The markings are longitudinal, and show considerable variability; there are usually a dark dorsal line and dark subdorsal band and a pale lateral band; sometimes the dorsal area has diamond-shaped markings as in many *Eupithecia*. Pupation takes place in a slight cocoon. The pupa is light brown, of about the ordinary form, wing-veins very prominent, cover of prothoracic spiracle a raised dark button, anal armature consisting of two sharp spines. The moth appears in the summer, the exact date varying with the locality. It flies in the sunshine about the bracken or other plants among which its foodplant grows. It is common and widely distributed in the Palearctic Region, though absent from the extreme north, and apparently confined in the south to high altitudes.

11. Genus: **Palaeomystis** Warr.

Palpus short. Antenna in both sexes nearly simple, rather short. Hindtibia with all spurs. Wings smoothly and rather thinly scaled. Forewing slightly produced at apex, first and second subcostals stalked, the second anastomosing with the third and fourth. Hindwing sharply produced at the end of the second subcostal, cell rather short, in ♂ with a much produced posterior arm, second subcostal arising from cell, radials normal in ♀, the second in the ♂ from lower arm of cell, thus much nearer to the third than to the first, abdominal margin in ♂ somewhat cut away. Early stages unknown. The genus, easily recognized by the shape and texture of the wings, consists of only two species, both occurring just within the Palearctic Region but probably Indo-Australian rather than Palearctic in their origin. The other genera with which they appear to have most in common — *Abraxaphantes*, *Doratoptera*, *Loxorhombia* and *Heteralex* — are entirely Indo-Australian.

P. falcataria Moore (1d). Bluish or greenish white with a silky gloss. Both wings with four *falcataria*. grey transverse lines, somewhat variable in distinctness and thickness, the second and third on both wings meeting at inner margin, the third on hindwing nearly always angled or strongly bent in middle. Discal marks weak or wanting. Under surface with the third line distinct, often thickened, the others usually weak or wanting; occasionally a well-marked discal spot on forewing. N. India to W. China and Tibet.

P. mabillaria Pouj. (1 c). Much smaller than the preceding, with less lines and these very ill-defined, *mabillaria*. a postmedian on forewing manifesting itself chiefly by strong dark spots on second radial and at inner margin.

The fringe, which in *falcataria* is unmarked, is in *mabillaria* strongly spotted with fuscous at the vein-ends. Under surface similar. W. China: Mou-pin, Wa-Shan and Huang-Mu-Chang.

12. Genus: **Gypsochroa** Hbn.

Palpus rather short and slender. Antenna rather long, in both sexes finely ciliated. Legs long and slender, hindtibia without median spurs, the terminal ones very short. Abdomen slender. Wings rather narrow, with smooth, glossy scaling. Forewing with cell rather long, second subcostal wanting, first subcostal anastomosing twice. Hindwing with costal closely approximated to cell to one-half, second subcostal not stalked. Only one species known. Possibly related to *Orthostixis*, although the ♂ genitalia do not show any sign of affinity.

renitidata.

G. renitidata Hbn. (1 c). Wings as well as face, antenna, etc., uniformly white, only the underside of forewing slightly smoky. Early stages apparently unknown. The moth is local, occurring from S. E. Russia to Asia Minor, and little seems to be recorded as to its habits. It has been taken locally also in Ardèche, South-east France. The life-history has recently been made known by CHRETIEN. The eggs are laid in rows of 2—6 on the leaves of *Linaria striata*, and are yellowish white, with rows of small oval depressions. The larva hatches in 10—12 days. It is sub-cylindrical, the segmental incisions deep, the colour bluish white with brown latero-dorsal band, tubercles and setae small; but is chiefly remarkable for the possession of two additional pairs of rudimentary prolegs on the 4. and 5. abdominal segments, which, however, become still more minute in the adult larva. Pupa slender, whitish, with darker head, brown dorsal line and yellowish wing-cases, the extremities of which are free, reaching as far as the 7. or 8. abdominal segment; in a cocoon on the foodplant, resembling in texture that of *Nola*. That of the summer generation produces the imago in about a fortnight but the autumn pupae hibernate. The moth appears in May and June and again in July to August, and rests among the *Linaria*, folding the wings closely around the twigs.

13. Genus: **Orthostixis** Hbn.

Characters somewhat as in the preceding genus, but antenna and legs shorter, wings much broader, forewing with all veins present, first subcostal arising from costal, second to third stalked, their stalk anastomosing with first and usually with fourth, hindwing with costal further from subcostal, in *cribraria* connected with it by a bar near the base. Geographical range somewhat limited, the only two known species being almost confined to the Balkan Peninsula, Asia Minor and Transcaucasia. The larva of one of the species has been made known within the present century, and is briefly described below.

cribraria.

O. cribraria Hbn. (= *laetata* F.) (1 d). White, the forewing with two, the hindwing with one row of black dots on the veins representing the lines. Both wings with black cell-spot and series of intraneural dots on the distal margin. Underside similar, the proximal series of dots obsolete. — Larva dorsally dirty green, marked with yellow subdorsal line, yellow lateral protuberances, ventral surface mainly yellow; tubercles black, distinct, bearing long whitish bristly hairs. Pupa at the head light brownish, otherwise bone-white with black markings and some yellow spots. The moth is double-brooded (May and August) and occurs from S. E. Europe to Armenia.

calcularia.

O. calcularia Led. (1 d). Similar to the preceding, somewhat larger, but at once distinguished by the more oblique course of the proximal series of black spots and by the dark smoky underside of the forewing. The spots, moreover, show a tendency to be enlarged into dashes, and structurally the present species differs in the obsolescence or entire absence of the bar between costal and subcostal of hindwing. Known only from northern Asia Minor and Transcaucasia.

14. Genus: **Centronaxa** Prout.

Nearly related to *Orthostixis*, but with the palpus more minute, the antenna bipectinate in both sexes, the branches moderate or long in the ♂, shorter in the ♀, wings more thinly scaled, less pure white, radials of forewing strongly curved, hindwing with costal more nearly approximated to cell near base, second discocellular rather oblique, third nearly vertical, the bend at origin of second radial being therefore distad instead of proximad. The early stages are still unknown. The name-type of the genus, *orthostigialis* Warr., inhabits North India, but the others all belong to central and western China. All are closely related.

C. margaritaria *Leech* (1 d) shows the general scheme of markings that is common to the group, the *margaritaria* submarginal series of black spots (as is usual in this and the following genus) placed nearer to the distal margin than in *Orthostixis*. Antemedian line of forewing consisting of elongate dashes on the costal, subcostal and median veins and inner margin and a spot on the submedian. Both wings with a spot on middle of inner margin (which is wanting in *Orthostixis* and *Naxa*). Only known from Chang-yang, central China, taken in July.

C. contraria *Leech* (1d) is exceedingly like the preceding, but larger, rather less transparent, *contraria*. the spots larger, those of the antemedian series relatively shorter and thicker. The ♂ antennal pectinations are longer. Central China: Chang-yang and Ichang, in July.

C. montanaria *Leech* (1 e) is still larger, the anal angle of hindwing more prominent. The spots are *montanaria*. even smaller than in *margaritaria*, the antemedian series not, or scarcely, prolonged into dashes. Western China: Omei-shan and Wa-shan, in June.

15. Genus: **Naxa** *Walk.*

Very similar to the two preceding genera, especially to *Centronaxa*, but differing from both in the entire absence of spurs on the hindtibia and usually of the frenulum; from *Orthostixis* further in the minute palpus, more rounded forewing and less simple antenna; from *Centronaxa* in the more normal discocellulars. I hitherto overlooked the presence of the frenulum in a single species, *angustaria*. This is the more inexcusable as it is mentioned by LEECH. The species ought, on this character, to form a separate genus. For the present I merely recognize three subgenera:

- | | |
|--|--|
| I. Antenna bipectinate with moderate branches. Frenulum absent | Naxa <i>Walk.</i> |
| II. Antenna biserrate. Frenulum absent | Psilonaxa <i>Warr.</i> |
| III. Antenna very shortly bipectinate. Frenulum present | Desmonaxa , <i>subgen. nov.</i> |

The distinctions apply to both sexes, and could easily be treated as generic. The facies of all the species is remarkably uniform. The larvae have not been described, but according to PRYER are hairy, gregarious, living in a web, that of *seriaria* on privet. I have received a series of *angustaria* from Chungking, bred by BARRY from collected cocoons, and gather that this species also is gregarious and the pupa not subterranean, but I have no further information at present.

N. textilis *Walk.* (= *cypraria* *Guen.*, *hügeli* *Feld.*) (1 d) is usually distinguishable, apart from its *textilis*. more strongly pectinate antenna, by its ocellated discal spots, which, moreover, are of a less deep black than in *seriaria* and *angustaria*. This ocellation of the discal spots is, indeed, somewhat inconstant, but seems especially prevalent in the more northern forms of the species. According to SWINHOE, the antennal pectinations of the form *hügeli* are much longer than those of *textilis*. If this were the case, it would naturally have to rank as a distinct species, but we suspect that he confounded ♂♂ with ♀♀, or else mistook some other species for *textilis*. *textilis* is widely distributed throughout India.

N. seriaria *Motsch.* (= *laetata* *Brem.*, nec *F.*, *taicoumaria* *De l'Orza*, *bremeraria* *Stgr.*) (1d). White, *seriaria*. the black markings placed as in all the genus, namely: three large black vein-spots on forewing at about one-third from base, placed in a slight curve, a large cell-spot on each wing, a submarginal series of large spots on the veins and a marginal series of smaller ones between the veins. Underside the same, but with the antemedian spots weak. Distributed, and apparently in many places common, from West China to Amur and Japan. Belongs to the subgenus *Psilonaxa*.

N. angustaria *Leech* is distinguishable from *seriaria*, apart from the structural characters, by *angustaria*. the smaller discal spot of the hindwing. In addition, the submarginal spots are rather closer to the marginal, and are generally characterized, on both wings, by having the costal one larger and more conspicuous than the rest. Central and western China, June and July. Forms the type (and only yet known species) of the subgenus *Desmonaxa*, which — as indicated above — will probably require to be raised to generic rank.

16. Genus: **Aspilonaxa** *Warr.*

Palpus moderate. Antenna about two-thirds the length of wing, nearly simple in both sexes. Hindtibia with a pair of minute spurs, in ♂ broadened and flattened and with strong hair-pencil. Forewing with first three subcostals stalked, their stalk anastomosing with costal, third subcostal later anastomosing with fourth. Only one species known, which differs from *Naxa* in longer palpus and antenna, different neuration, and different wing-pattern.

obliquaria.

A. obliquaria *Leech* (= *lineata* *Warr.*) (1 e). White with a peculiar brownish smoky gloss. Forewing with first line curved, very faint, only indicated by some slight pale shading which accompanies it proximally; second line angled, then rather oblique, becoming median or almost antemedian on hindwing, indicated by a slight darkening of the ground-colour and accompanied distally by a pale band. Both wings with a large roundish discal patch and an apical patch pale bluish grey. Marginal spots black, distinct. Under surface white, with the discal and apical patches black, marginal spots as above. Western China: Omei-Shan in July, Chow-pin-sa in June.

17. Genus: **Ozola** *Walk.*

An Indo-Australian genus, of which a single species reaches the southern part of Palearctic Japan. The full description of the genus can be reserved for a later volume. The species is quite unmistakable by its contour, and structurally by the very wide separation of the costal vein of the hindwing from the cell, with which it is connected by a distinct bar. Practically nothing is known of the habits and life-history.

japonica.

O. japonica *Prout* (1 f). I erected this as a subspecies of *impedita* *Walk.*, with which it agrees in structure. But superficially it is nearer, especially in the less whitened ground-colour, the complete line and small discal spot of the hindwing, and perhaps one or two other characters, to *sinuicosta* *Prout*. From both it differs in the less angulated proximal line of the forewing and the stronger submarginal series of spots on both wings. It will probably prove a perfectly distinct species. Kiushiu: Nagasaki, June, 1886. Described from specimens in the British Museum. I have since seen it in coll. WILEMAN.

3. Subfamily: **Hemitheinae.**

A very interesting subfamily, of tolerably uniform structure, especially in the constancy with which the second radial vein of the hindwing (and frequently also of the forewing) arises near the anterior angle of the cell. The prevalence of bright green colouring of the wings is also very noteworthy, and has gained for the subfamily in England the popular name of the „Emeralds“, in America of the „Greens“. The principal structural characters are as follows. Face nearly always smooth. Antenna very generally bipectinate in the ♂, and often even in the ♀ (never unipectinate). Hindleg in ♂ rarely aborted, spurs variable according to the genus. Abdomen often with dorsal crests. Forewing almost invariably with all veins present, the second to fifth subcostal almost invariably stalked. Hindwing with costal vein variable, second radial arising anteriorly to middle of discocellulars. Larva usually with head bifid, prothorax elevated, usually with double point anteriorly, body strongly granulated. Feed chiefly (so far as known) on trees and shrubs, and are usually rigid, wonderfully assimilated to small twigs. A few show still more specialized protective adaptations, those of one group (that of *Comibaena*) clothing themselves with fragments of leaf, which are attached to special tubercles by means of silken threads. Pupa usually green or rather light-coloured, often strongly marked with blackish, spun by a few threads among leaves. The moths of the more ancestral genera rest on tree-trunks or fences, and are of prevailing grey or lichen-like colouring. The more specialized rest among green foliage, and are, on account of their green coloration, well protected. They are often very sluggish by day, and when disturbed prefer to flutter lazily to the ground, like falling leaves, rather than to escape the threatened danger by flight. The normal time of flight is the evening or night, and they may be attracted by light; but both in North America and in Australia the species seem hitherto, for the most part, to have been taken in comparatively small numbers. The Palearctic Region is not remarkably rich in species, but several of them are extremely common locally. The subfamily does not generally ascend to high latitudes or altitudes, and is wanting also in New Zealand, Hawaii, most of Chili and Patagonia. Otherwise its distribution is wide.

1. Genus: **Archaeobalbis** *Prout.*

It is by no means certain that this genus extends into the Palearctic Region, as the two species

which appear likely, from the figures, to belong to it are unknown to me in nature. I have erected it for a few species of similar structure to *Actenochroma* and *Herochroma* but with the second subcostal vein of the forewing arising from the cell — an ancestral character which in this subfamily is otherwise only retained in four primitive Australian genera. The species are chiefly Indian. The colour of the upperside is usually moss-green, mixed with reddish or purple. In some species the hindwing is greatly elongate and dentate, and these usually have the under surface variegated, a broad dark band traversing both wings before the distal margin. A few species have more normally shaped hindwing, and sober grey underside.

A. sinapiaria *Pouj.* (3 c), is described as of a pale mustard green finely sprinkled with brownish, distal margin (especially of hindwing) dentate, with dark lunules between the teeth, postmedian line acutely dentate on the veins, sinuate between the third radial and the medians, followed by slight blackish shading, and this again by a submarginal series of greenish brown spots; forewing also with a strongly dentate ante-median line. Under surface yellowish white with some broad blackish shades in distal part. A single female from Mou-pin.

A. crassipunctata *Alph.* (1 g), described as a *Gnophos*, would seem from the figures to be a near relative of *usneata* *Feld.*, *hypoglaucia* *Hmps.* and *farinosa* *Warr.* — the group of *Archaeobalbis* with less elongate hindwing and nearly uniform underside. It is described as cinereous brownish, the hindwing, especially at base, strigulated with grey, a waved brownish postmedian line, dotted with fuscous on the veins, and an interrupted dark marginal line. Underside yellowish-white, sparsely irrorated with grey, and with a very large black discal spot on each wing. The figure shows further on the upper surface a series of reddish intraneural blotches on both wings, distally to the postmedian line, and a much smaller, more lunular submarginal series. Turkestan: Aksai.

2. Genus: **Pingasa** *Moore.*

Palpus with third joint in ♀ long. Antenna rather long, in ♂ bipectinate, but with a long apical portion simple. Abdomen with paired crests. Hindwing elongate, especially in ♂, crenulate but without any strongly projecting teeth. Forewing with first subcostal vein usually free; hindwing with costal approximated to cell near base, then diverging very sharply, second subcostal arising from cell, some tufts of raised scales on upperside on and behind the discocellulars. A very natural genus, widely distributed in the Indo-Australian and Aethiopian Regions, but scarcely spreading into the Palearctic. The facies is very uniform, the general coloration whitish or grey (very rarely green) the distal area, at least on the under surface, more or less strongly darkened. The larva seems to be allied to *Pseudoterpna*.

P. pseudoterpnaria *Guen.* (= *pryeri* *Butl.*) (1 f). Smaller and greyer (tinged with brown) than most of its allies, the distal area not appreciably darker on the upperside than the rest of the wing. Under surface white, the proximal part (at least on forewing) more or less dusted with grey, both wings with large cell-mark and rather broad submarginal band, which on the forewing generally spreads to the margin in the middle of the wing and sometimes posteriorly, but always leaves a clear, white apical patch. Japan to western China, apparently in two generations. Scarcely distinguishable above from the Indian *tephrosiaria*, which is likely a local race of it, but which has the base of the underside clearer white and the submarginal band often narrower.

P. alba *Swinh.* (1 e). Variable in colour, from clear white to a brown-grey like that of the preceding, but very distinct in its thick deep-black postmedian line, not dentate, but sending out short rays distad along the veins. Under surface without distinct white apical patch. Japan, N. China and Assam. A rather large and very handsome species. The Japanese form seems to be usually, though not invariably, greyer than the Indian.

P. lahayei *Ob.* (1 g) somewhat suggests on the upperside a miniature grey specimen of *alba* but with a less regular postmedian line; beneath, the distal area of the forewing shows a blackish patch at the costa, that of the hindwing small patches about the second radial and second median veins. Only known from North Africa.

3. Genus: **Metallolophia** Warr.

Palpus moderate, third joint in ♀ moderate or longish. Antenna rather long, lamellate or nearly simple. Abdomen crested, in the nametype (*vitticosta*) with the crests metallically glossy. Forewing in ♂ more or less elongate, the distal margin being very oblique, first subcostal vein free; hindwing with neuration nearly as in preceding genus. Excepting *arenaria*, only a few Indo-Malayan species are known. The genus is closely related to *Terpna*.

arenaria.

M. arenaria *Leech* (1 e). Whitish, with slight olive-brown clouding and with coarse purple-brown irroration in places. The lines and a very large oval discal mark on forewing olive-brown, the discal mark surrounded, and the postmedian line in part overlaid with dark purple; postmedian line irregular, much excurved anteriorly, but without sharp angles as in *opalina* Warr. Hindwing weakly marked (probably somewhat faded). Under surface of both wings with some blotches near base, large oval discal mark and thick, curved postdiscal line or shade. Central China: Kiukiang. Only LEECH's type (♀) yet known.

4. Genus: **Terpna** H.-Sch.

Not very sharply differentiable from the preceding genus, which could almost be treated as a subgenus of it. Frons strongly protuberant, antenna in ♂ nearly always, and in ♀ sometimes bipectinate, thorax densely hairy beneath, metathorax sometimes crested, abdominal crests never metallic. Forewing broad, with distal margin not extremely oblique.

A genus of ample-winged, robustly built moths of rather wide distribution in the south-eastern Palearctic and the Indo-Australian Regions. They show a good deal of diversity in structure, and I have elsewhere divided the genus into 8 subgenera according to the antennal structure, shape of wings, length of cells and other characters. For the half-dozen Palearctic species this subdivision may be set aside.

decorata.

T. decorata Warr. (= *dorsocristata* *Pouj.*) (3 c). Antenna simple. Distal margins of wings not crenulate. White, finely dusted with olive brown, both wings with a curved or angulated dark cell-mark and a much interrupted postmedian line, the latter followed distally by some reddish blotches, that nearest apex of forewing large, fuscous-mixed, tridentate. Forewing also with large antemedian spot on costa. Underside with the markings ampler, more fuscous, the cell-spots very large. Bhotan, Mou-pin and Chang-Yang.

amplificata.

T. amplificata *Walk.* (1 e). Antenna in ♂ pectinate. Abdominal crests not strong. Wings with cells very short. White, heavily blotched with brownish grey, and more or less strongly clouded with yellow distally, especially at anal angle of both wings, forewing with a small yellow patch at base. Under surface similarly marked, but without the yellow distal shading, the proximal on the other hand somewhat extended and common to both wings. Distributed across China at about 30° N. Lat. Variable in the strength and extent of the yellow shading.

leucomelanaria.

T. leucomelanaria *Pouj.* (1 e). Nearly related to *amplificata*, but more darkly and heavily marked with grey, which here becomes nearly or quite black. The distribution of the dark colour is also different, especially on the forewing, where it almost covers the distal third of the wing, widens still further in apical area, and extends more narrowly and somewhat interrupted along costa. Only known from Mou-pin.

superans.

T. superans *Bltr.* (1 g). Antenna rather short, in ♂ with moderate, in ♀ with short pectinations. Build very robust, especially in ♀. Cells not very short. Very pale brownish, the entire wing, or at least a band distally to the postmedian line, dusted with grey or olive-grey. Postmedian line dentate, weak except from costa to first radial and on the other veins; forewing also with a weak antemedian line. Underside with cell-marks and postmedian clouding very large and heavy, two dark streaks on grey clouding at base. ♀ usually much larger than ♂. Japan.

leopardinata.

T. leopardinata *Moore* (1 g). Antenna moderately long, in ♂ shortly, in ♀ not bipectinate. Metathorax moderately, abdomen strongly crested. Forewing yellowish green, thickly sprinkled with fuscous, suffused with reddish in central area and distally to the postmedian line. Lines dark, diffuse, overlaid with shining

bluish scales, the postmedian repandate at third radial. Hindwing bright orange-yellow, the base and most of inner margin fuscous, some fuscous speckling at distal margin, an unusually large blotch at end of cell, a broad, slightly interrupted band before distal margin. Under surface of both wings yellow, nearly white at distal margin, large dark cell-patches and very broad submarginal bands (on forewing touching the margin in places), besides some grey speckling and an obscure grey cloud occupying most of posterior (inner) margin. Originally described from Bengal, occurs also at Yatung, Tibet.

T. davidaria *Pouj.* (3 c). which I have not seen, is possibly a form — certainly a very close relative — of *davidaria*. the preceding, closely approaching the form *mölli* *Warr.* from Sikkim, but with the black markings of hindwing and underside still further reduced, in particular almost wanting at the margins. Mou-pin.

5. Genus: **Dindica** *Moore*.

Related to *Terpna* through such species as *leopardinata*, but at once distinguishable by having a dense tuft of projecting scales from the frons, an enormously developed metathoracic tuft, and the crest on the fourth abdominal segment unusually strong. As with all the preceding genera of the subfamily, the true home of the present genus is India. The single Palearctic species shows the special generic characters somewhat less highly developed than in its relatives, but its systematic position is not open to doubt.

D. virescens *Bltr.* (= *koreana* *Alph.*) (1 g). Forewing olive-brown, slightly or strongly and coarsely *virescens*. speckled with fuscous and with a faint reddish suffusion about the discal spot; antemedian line very oblique and deeply dentate, postmedian oblique from costa to near distal margin on radials, thence strongly retracted; antemedian line accompanied proximally and postmedian distally by reddish clouding. Hindwing paler, with broad dark marginal band. Underside of both wings nearly as hindwing above, forewing with large cell-spot. Japan and Korea, occurring from July to September.

6. Genus: **Sphagnodela** *Warr.*

Palpus with third joint small. Antenna in ♂ with rather short, clavate pectinations. Metathorax slightly crested. Abdomen crested. Forewing with first subcostal anastomosing with costal. Hindwing with costal approximated to subcostal as far at least as to middle of cell, second subcostal usually short-stalked with first radial.

The genus contains only a single species, which has a somewhat restricted range in North India and Tibet.

S. lucida *Warr.* Forewing yellow-green (probably richer moss-green when absolutely fresh) coarsely *lucida*. speckled with fuscous. Lines thick, lunulate-dentate, the postmedian repandate at third radial. Some whitish submarginal spots between the veins, accompanied irregularly by larger fuscous spots. Hindwing much paler, only the distal margin concolorous with forewing. Underside of hindwing nearly as upper, of forewing clouded nearly throughout with dark greyish. Sikkim to Tibet.

7. Genus: **Pseudoterpna** *Hbn.*

Palpus with third joint short. Antenna in ♂ shortly pectinate. Abdomen crested. Forewing with first subcostal vein usually free. Hindwing with costal approximated to subcostal to nearly one-half the length of the cell. Base of costa of hindwing very slightly expanded, frenulum in ♀ consisting of only a few long hairs. Larvae moderately stout, rigid, nearly cylindrical, with slight lateral flange, skin-surface strongly shagreened, tubercles and setae very small. Feed on species of *Genista* and allied *Papilionaceae*. — *Pseudoterpna* is the first essentially Palearctic genus of the subfamily, occurring from Europe to Armenia and N. W. China. It is probably descended from *Pingasa*, but lacks the raised scales on the wings, has quite different palpus, different course of costal vein of hindwing, and especially shows the commencement of the basal costal expansion and weakening of frenulum which are characteristic of so many of the succeeding genera of the *Hemitheinae*.

P. pruinata *Hufn.* (= *prasinaria* *Fab.* = *cythisaria* *Schiff.* = *genistaria* *Vill.*) (1 f). Green, sometimes *pruinata*. more, sometimes less bluish, mixed with whitish, the forewing with two, the hindwing with one dark green transverse line, varying in intensity and in exact position; submarginal line thick, whitish. — ab. *agrestaria* *agrestaria*. *Dup.* is nearly unicolorous, the dark lines being entirely effaced. It possibly tends to form a local race in

viellata. some places (as southern France) but certainly occurs in others together with the type. — *viellata* Krul., from East Russia, perhaps truly a local race, would appear, from its author's description, to be closely similar to the last-named form, but larger and probably darker, less mixed with white. — As *fasciata* *ab. nov.* may be described a handsome form of occasional occurrence (at least in Britain) with the lines of forewing somewhat approximated and the area between them considerably darker than the ground colour. The larva of *pruinata* is stout, tapering anteriorly; head deeply bifid, the divisions pointed; prothorax produced to two points anteriorly, body nearly cylindrical, with slight lateral flange, surface strongly granulated with whitish; green with white subdorsal lines, pink lateral line and usually tipped with pink on the points of head and prothorax and at anus; tubercles and setae dark, but minute. Hibernates small, and feeds up rapidly in the spring. It may easily be found (by the practised eye) resting rigid and motionless on the foodplants (especially *Genista anglica*), to the colour of which it is beautifully assimilated. Pupa of moderate width, tapering anteriorly; light brown or clay-coloured or greenish, irregularly dark-spotted, supra-anal plate long. Rests in a very slight cocoon formed of a few threads among leaves. The moth appears in the summer months and frequents heaths or moors, or open places in woods. It is easily disturbed by day, but its flight-time is the night, when it is a frequent visitor to light. It occurs throughout central and south-eastern Europe and in Asia Minor.

coronillaria.

P. coronillaria Hbn. (1 f) supplants *pruinata* in south-western Europe and in Syria, and as the two seldom occur side by side the suggestion has occasionally been put forth that they are local races of a single species. The genitalia, however, present tangible differences, the „gnathos“ (lower arm of the mandibulate uncus) being provided with much larger teeth in *coronillaria*, and it is therefore preferable to regard the last-named as distinct. The grey instead of green colour at once distinguishes *coronillaria*. The larvae are extremely similar, although *pruinata*, so far as I have observed, is somewhat the more brightly coloured larva, the tubercles somewhat less minute and darker coloured, spiracles somewhat more conspicuous. — *ab.*

armoraciaria.
axillaria.
corsicaria.

armoraciaria Ob. (1 f) is a unicolorous dark aberration from S. W. France and Spain. — *ab. axillaria* Guen., from Syria, also has the dark transverse lines almost obsolete, but agrees in colour with the type. — **corsicaria** Rbr. (1 f) represents *coronillaria* in Corsica and Sardinia, and has usually been considered a separate species. It is said to differ from *coronillaria* in having longer antennal pectinations, a less black face, but darker fillet between the antennae and rather stronger abdominal crests. Larva with triangular white dorsal ornamentation, feeds exclusively on *Genista corsicaria*, and in two generations.

simplex.

P. simplex Alph. (3 a) from Central Asia has been regarded as a variety of *pruinata*, but according to PÜNGELER (in litt.) is really a distinct species. It is of a uniform whitish green colour, and especially differs from all the forms of *pruinata* in having the frons white, only quite weakly tinged with brownish, whereas in *pruinata*, as well as in *coronillaria*, it is black. The size is perhaps on an average larger than that of *pruinata*.

8. Genus: **Gnophosema** Prout.

Palpus rather short, second joint densely scaled beneath. Tongue wanting. Antenna in ♂ pectinate. Hindtibia with terminal spurs only. Abdomen not appreciably crested. Wings shaped as in *Pseudoterpna*, forewing with second subcostal arising beyond fifth, hindwing with second subcostal short-stalked. Early stages unknown. This genus is required for a single species, which was first described as a *Gnophos*, transferred to *Boarmia* by Hampson, but which, notwithstanding its colouring, certainly belongs to the present subfamily. Unfortunately I have only seen two specimens, both ♂, and neither quite perfect.

isometra.

G. isometra Warr. Reddish-grey, irrorated with fuscous, both wings with a distinct cell-spot, that of the forewing large, sometimes ocellated, an indistinct denticulated postmedian line and an interrupted marginal line, forewing also with a dark spot on inner margin indicating the end of an obsolete antemedian line. Underside (especially of hindwing) paler, without markings. The first known specimen was from Akhor (? Akora), near Campbellpur. There is also an example from Kashmir in coll. Brit. Mus. Apparently flies in April and May.

9. Genus: **Agathia** Guen.

We here commence a group of genera which are probably collaterally related to some of the earlier

ones, agreeing with them in the full development of the frenulum, but having taken an independent path of evolution in some respects. The colouring is generally green, at least in great part, sometimes with an admixture of rich brown resembling withered leaves, and not infrequently with a more or less jagged wing-outline. In *Agathia* the face is rounded-prominent, palpus in ♀ with third joint long, antenna in both sexes nearly simple, hindtibia in ♂ strongly dilated, with hair-pencil and usually a short, broad terminal process, abdomen often crested, forewing with first subcostal nearly always free, hindwing strongly tailed at third radial and slightly or rather strongly at first radial, second subcostal not stalked. Early stages imperfectly known. The genus is a large and very natural one, spread over the entire Indo-Australian Region, with a few stragglers in the Palearctic and Aethiopian.

A. lycaenaria Koll. (= *albiangularia* H.-Sch.) (1h) is a rather common and widely-distributed Indian *lycaenaria*. species, but was originally described from Kashmir, and has also reached the outskirts of the Palearctic Region in Western China. Bright green with the costal edge of the forewing red-brown. Markings purple-brown (♂) or red-brown (♀), sometimes edged with yellow. Forewing with a basal patch, a slightly bent antemedian band, thickening at the margins and in middle, in ♂ often reduced to a mere thread between, an irregular band near distal margin, forming a broad blotch in middle and smaller blotches or spots at margins, more or less interrupted between, a marginal line thickened into dark spots at apex and about the third radial. Hindwing with smaller basal patch and a submarginal band starting from a blotch near apex and running to a larger blotch in middle, which extends on to the tail of the wing, enclosing a large white spot; an isolated spot on inner margin marks the end of this band. Underside very much paler, with similar markings. The ♀, as is usual in the genus, has the markings all much more extended than in the ♂. The larva, according to a drawing by MOORE in coll. Brit. Mus., is brown, marked with white on face, with bluish white dorsal pattern and lateral spots. Pupa moderately slender, tapering anteriorly, brown, dorsally dark-speckled and with very large dark spiracular spots, anal armature consisting of 8 hooklets.

A. carissima Btlr. (= *lacunaria* Hed., ? *zonaria* Don.) (1h). Coloration similar to that of the preceding species, but the sexes less dissimilar. Line and band more continuous and uniform in width, inner line obliquely curved, reaching inner margin much further distally, submarginal band of forewing nearly smooth-edged proximally, in both wings reaching the distal margin in posterior half of wing, enclosing an ovate green patch in anterior half. Apparently common in Japan, and distributed from Korea to West China, representing in the Palearctic Region the Indian *hilarata* Guen. Both sexes vary somewhat in the width of the submarginal band, which, when broad, usually encloses on forewing one or two small green spots posteriorly to the constant large one. The specimen figured by DONOVAN, as long ago as 1799, under the name of *zonaria*, and said to come from China, looks more like a small aberration of the Indo-Malayan *laetata*, but even if it belongs here the name cannot be resuscitated, being a homonym.

10. Genus: **Aracima** Btlr.

Palpus in both sexes short, antenna short, in ♂ with short, subclavate pectinations, hindtibia in ♂ somewhat dilated, with small hair-pencil, abdomen scarcely crested, both wings with distal margin crenulate and a more noticeable excision between first and third radials, forewing with first subcostal anastomosing with costal and with second subcostal, hindwing with second subcostal arising from cell or from a point with first radial. The name-type of the genus is Palearctic; a second species, apparently referable to it, has recently been described from Formosa.

A. muscosa Btlr. (= *vestita* Hed.) (1h). Ground colour dull yellowish green, easily fading to a dirty yellowish (perhaps bred specimens would be brighter), the markings dark purple-brown. Both wings with a discal spot, that of forewing always and that of hindwing sometimes large and oval; on forewing followed posteriorly by a blotch of variable size, which sometimes reaches the inner margin, on hindwing usually accompanied anteriorly by a small blotch, placed slightly distally. A moderately broad marginal band, complete on hindwing, on forewing running from inner margin to third or second radial, indented at its extremity by the ground colour. The usual lines very faint or quite obsolete, the origin of the postmedian on forewing sometimes marked by a dark costal spot. Japan and Amurland, May to July. Very variable in the size of the markings, but always easily recognizable.

11. Genus: **Limbatochlamys** Rothsch.

Palpus moderate, with third joint in ♂ small (♀ unknown). Antenna bipectinate with extremely short branches. Hindtibia not dilated, all spurs well developed. Abdomen not crested. Forewing somewhat falcate, first subcostal anastomosing or connected with costal, hindwing with second subcostal arising from cell. Another very distinct genus in facies, erected by ROTHSCILD for a single Chinese species, which has remained rare.

rosthorni.

L. rosthorni Rothsch. (2 a). Forewing olive brown, the costal edge very pale brown, partly tinged with reddish and sparsely dotted with black, a black line (less distinct distally) separating this area from the ground colour; a postmedian line consisting of a row of dark dots on the veins. Hindwing paler, its anterior half concolorous with costa of forewing; a large lunular discal mark and a thick, dentate postmedian line. Under surface more reddish brown, speckled with black, forewing with a small discal spot and a straight thick postmedian line not reaching the margins. Central and western China, in July.

12. Genus: **Tanaorhinus** Btlr.

Palpus moderate to long, third joint in ♀ usually very long. Antenna in ♂ bipectinate. Hindtibia in ♂ dilated, with hair-pencil. Abdomen not crested. Forewing with apex falcate, first subcostal free. Hindwing with anal angle pronounced, sometimes produced into a small lobe. Early stages unknown. The genus belongs chiefly to the Indo-Australian Region. Except in the falcate forewing it differs little from *Hipparchus*, to which it would be possible to sink it as a subgenus.

confuciaria.

T. confuciaria Walk. (2 a) is the representative in Japan and eastern to central China of the Indian *reciprocata* Walk., from which it is scarcely distinguishable except in slightly robuster build, slightly less falcate apex, stronger pale markings, the postmedian more strongly dentate. Both species (or forms) are characterized by the broad, dentate white lines and especially by a plain green underside with brown discal spot and postmedian line, and rarely, on the hindwing, a series of roundish submarginal spots. The rest of the species have generally more variegated undersides, with less (or no) green colouring.

vittata.

T. vittata Moore (2 a) belongs, with *argentifusa*, *alternata* and an undescribed species from New Guinea, to a second section of the genus, less robust in build, more glossy, with the postmedian line straight, not dentate, and with a few minor differences in structure, to which WARREN formerly gave a separate generic name, *Mixochlora*. *vittata* is the most common and widely distributed species, ranging from Japan to Omei-shan and throughout North India, if not also to the Malay Archipelago. — **prasinus** Btlr., the Japanese form, differs slightly from the name-type in usually having the two central bands more closely approaching one another at inner margin, sometimes almost in V-form. Like all the group, its markings consist of an alternation of glossy green and silvery. Under surface mostly yellow, with thick greyish postmedian and subterminal lines. The moth appears in June and July, and again in the autumn.

*prasinus.*13. Genus: **Hipparchus** Leach.

This genus, which is usually known by the name of *Geometra* Treits. (a historically incorrect application of the name *Geometra* L.) is also the *Terpne* of HÜBNER (nom. nud.), *Holothalassis* of HÜBNER, *Lep-tornis* of BILLBERG (nom. nud.), but the name of *Hipparchus* Leach must be restored to it. The genus belongs chiefly to the Eastern Palearctic Region and Northern India, but has as its name-type the well-known *papilionaria*, the finest of the *Hemitheinae* of Europe.

Palpus moderate to long, antenna in ♂ bepectinate, hindtibia in ♂ usually with hair-pencil, always with all spurs, abdomen not crested, wings ample, forewing with apex usually acute, first subcostal free or anastomosing with costal, hindwing usually with a bend or small tail at the end of third radial, sometimes crenulate throughout, second subcostal arising near end of cell. Some slight variations in wing-shape and structure have given rise to the erection of some unnecessary genera — *Megalochlora*, *Loxochila*, *Chloroglyphica*, *Hydrochroa* — which are here merged in *Hipparchus*.

The early stages of *papilionaria* are well known, and are briefly described below, but information is still wanting as to those of most of the species.

H. papilionaria L. (1i). Bright green, the forewing usually with two lunulate-dentate white lines, the hindwing with one, the lunules in the submedian area of forewing the thickest; both wings usually in addition with a faintly darker green cell-mark and some indistinct white intraneural spots distally to the postmedian line. Under surface similarly but more weakly marked, with no antemedian line. — ab. **herbacearia** Mén. is a form in which both the lines are obsolete. It was originally described from Amurland, and as a separate species, and perhaps on this account has been quite unnecessarily treated as problematical. Even STAUDINGER has only cited it to *papilionaria* with a query. Yet the aberration appears occasionally in other localities together with the commoner forms, and KUSNEZOV writes me that the type specimen confirms the identification. — ab. **cuneata** Burr. is characterized by a large wedge-shaped white spot adjoining the discal mark proximally, in addition to the usual markings. — ab. **subcaerulescens** Burr. is of a bluer green ground-colour than the normal, but is probably scarcely worth naming. — ab. **deleta** Burr. is another unimportant aberration, in which the distal series of white spots is entirely obsolete. — in ab. **subobsoleta** Burr. the antemedian line of the forewing is likewise obsolete. — ab. **alba** Gillm. is entirely white, above and beneath, slightly tinged with yellowish. — The egg of *papilionaria* is approximately oval, broader at one end and here flattened; it is strong and heavy-looking, the surface sculptured with strongly marked cells, the micropyle shown by a shallow, circular rayed pit. The larva feeds on birch and alder, and has been closely studied for its beautiful protective adaptations. It is rather stout, rugose, the surface shagreened, the head slightly notched, the setae mostly with enlarged summits. The larva hibernates small, and is at this time brown in colour, protectively assimilated to the tiny twigs. In the spring many become green, and they are wonderfully like the birch catkins among which they feed, various small protuberances and projecting edges of segments enhancing the resemblance. The pupa is cylindrical, tapering regularly from the fourth abdominal segment to the anal extremity; spiracles and tubercles distinct, the latter dark-coloured, bearing short curved setae; anal armature consisting of 8 hooks; the general colour is pale green, the wing-cases tinged with brown. The moth is on the wing in July and early August, and flies at late dusk, or more freely towards midnight. It is strongly attracted by light, around which it flies very wildly, and it will often visit „sugar“. By day it is very sluggish, and even when resting fully expanded on leaves it is very inconspicuous. Its range is wide in Central and North Europe, northern Asia Minor and across Siberia to Japan.

H. pratti Prout (= *flavifrontaria* Leech, nec Guen.). Expanse of wings 59 mm. Very similar to *flavifrontaria* Guen., build somewhat more robust, palpus somewhat longer, colour brighter green, postmedian white line of forewing broader, somewhat oblique. Ichang, June, 1888, one ♀ in coll. Brit. Mus.

H. sponsaria Brem. (1h). Colour of *papilionaria*, but structurally distinct in having the apex of the antenna simple, whereas in *papilionaria* the pectinations continue, and in having a strong anal tuft, and superficially differing in shape (distal margin of forewing irregular, bent in middle, of hindwing tailed) and in having the white lines fine, not dentate, that of hindwing straight; a very faint, fine lunulate line in place of the distal white spots. E. Siberia and Japan, from the end of June until August.

H. dieckmanni Graes. (1h). Similar to *sponsaria*, but with distal margin of forewing scarcely bent, of hindwing scarcely tailed, the white lines of forewing expanding into conspicuous spots on costa, hindtibia with a terminal process which is wanting in *sponsaria*. Our figures unfortunately do not bring out the distinctions. Larva green, each segment bearing a dentate prominence, tipped with red-brown. On *Quercus mongolica*. South-east Siberia, Korea, Japan, larva full-fed in early June, imago found in July.

H. glaucaria Brem. (= *usitata* Btlr.) (1h). Colour more bluish green than the three preceding. Shape nearest to that of *dieckmanni*, but with the distal margin of forewing even smoother. White lines thicker than in *dieckmanni*, those of forewing similarly expanding on costa, but that of hindwing running to near anal angle instead of to inner margin at before two-thirds. Under surface with posterior part of forewing and a great part of hindwing whitened. Larva on *Quercus mongolica*. Amurland to Japan, appearing in June.

H. albovenaria Brem. (1i) is a very beautiful species, with the ground-colour somewhat similar to that of the preceding, but with the costa of forewing and the veins of both wings broadly white. Lines broad, nearly straight, excepting the slender submarginal one; antemedian dark-shaded distally, postmedian proximally. Under surface similar. Shape of hindwing nearly as in *papilionaria*, of forewing less regular than in that species, already approaching *sponsaria*. Distributed in Palearctic Eastern Asia.

mandarinaria. **H. mandarinaria** *Leech* (1 i) is related to *albovenaria*, the margins of the wings not crenulate, the veins not marked by white. Antemedian line slightly curved, postmedian broad, rather straight, slightly oblique; an elongate whitish cell-mark which is not present in any other species of *Hipparchus*. Under surface of forewing partly, of hindwing largely whitish. West China: Chow-pin-sa. One ♂, taken in June, in coll. Brit. Mus. Recently also recorded from Hondo and Yezo (Japan) in April and July by WILEMAN.

valida. **H. valida** *Feld.* (= *dioplasaria* *Christ.*) (1 i). A very large species, shaped somewhat as *albovenaria* but with the irregularities in the wing-margins exaggerated, the markings also nearly as in *albovenaria* but more slender, the veins not broadly white. Under surface similar to upper. Amurland to Korea and Japan, appearing about midsummer.

vallata. **H. vallata** *Btlr.* (1 h). Considerably smaller than the other species, and at once distinguished by a dark spot in the fringe at the end of the third radial of hindwing. Probably nearest to *glaucaria*, which it resembles in the white-banded underside; forewing with distal margin less oblique, hindwing longer, with rather more marked tail, lines on forewing straighter, parallel, costa of forewing dark-speckled. Common in Japan from June to August; also known from Sikkim.

14. Genus: **Iotaphora** *Warr.*

Palpus moderate, with third joint small. Antenna in ♂ bipectinate. Hindtibia in ♂ dilated, with hair-pencil. Abdomen not crested. Wings smooth-scaled, iridescent. Forewing with first subcostal free. Hindwing with second subcostal from near end of cell. Only two species are known, so nearly related that they have sometimes been taken to be forms of a single species. The name-type of the genus, *iridicolor* *Btlr.*, belongs to North India, the second species, which is here figured, represents it in the Palearctic region. The moths are very distinct in facies from any others known, but in structure they present but few differences from *Hipparchus*, to which, moreover, GRAESER compares the larva of *admirabilis*.

admirabilis. **I. admirabilis** *Ob.* (1 i). Differs from *iridicolor* in having stronger and sharper markings, with the distal area more differentiated in colour from the rest of the wing, cell-mark of forewing rather shorter, postmedian line of hindwing straighter. The larva feeds on *Juglans mandchurica*, on which it was discovered by GRAESER, who describes it as light green, deceptively like a young, half-expanded leaf of the foodplant; head produced into two points, body contracted; rests rigidly attached by the prolegs to a twig. Pupates in a loose cocoon among dry leaves, and the imago appears in the second half of July, and in August, frequenting damp, densely wooded places, from western China to Amurland.

15. Genus: **Chloromachia** *Warr.*

An Indo-Australian genus of only two or three species, until recently entirely unknown from the Palearctic Region. The species which WILEMAN has just described from Japan is, however, quite closely related to the widely-distributed *divapala*, fully agreeing in structure. The genus is characterized by long third joint of palpus in the ♀, ciliate antenna of both sexes, densely hairy pectus, short cells (especially of hindwing) and stalking of first median of hindwing. From *Ochrognesia*, which it somewhat resembles in facies, it may be readily distinguished by the non-pectinate antenna of the ♂ and the long palpus of the ♀.

infracta. **C. infracta** *Wilem.* Bright green, costa of forewing fleshy ochreous speckled with brown. Forewing with the lines fine, white, indistinct anteriorly, a moderate-sized white spot at middle of distal margin. Hindwing with postmedian white line strongly outcurved between third radial and second median, the area distally to it mostly occupied with flesh-coloured blotching, speckled with brown in places. Under surface whitish, forewing green in costal half and with a rather large dark cellspot, hindwing with a dark apical blotch. Recalls the female of *divapala*, but has only a very minute instead of a large blotch at anal angle of forewing; moreover *divapala*-♀ lacks the white marginal spot. Of the new species only the ♂ is known. Collected in August 1900 and 1901 near Kobe and at other localities in the island of Hondo by WILEMAN.

16. Genus: **Ochrognesia** *Warr.*

Palpus with second joint rather long, rough-haired above and beneath, third joint small. Antenna in ♂ shortly pectinate. Legs short, hindtibia in ♂ dilated, with hair-pencil and terminal process. Abdomen not crested. Forewing with first subcostal free. Hindwing elbowed at end of third radial, cell short, second subcostal

and first median both stalked. Closely related to *Comibaena*, but with the hindwing elbowed, not rounded, the ♂ antennal pectinations much shorter, the ♀ palpus shorter and the ♀ frenulum stronger. Only one species is known.

O. difficta Walk. (= *gratiosaria* Brem.) (2 b). Bright green, both wings broadly but irregularly bordered *difficta*. with whitish (usually strongly mixed with reddish brown), the bordering occupying about half of the hindwing, with the ground colour encroaching more or less deeply between third radial and second median; on the forewing the bordering occupies a large area at anal angle, a patch in middle of distal margin and a blotch distally to a zigzag white line. Underside mostly whitish, with a few brown spots. Central China to Amurland.

17. Genus: **Spaniocentra** Prout.

Superficially similar to *Comibaena*, distinguished by the less fully rounded hindwing, which is slightly emarginate between the first and third radial veins, and especially by one or two important structural characters. Palpus with second joint smooth-scaled. Hindtibia with only one pair of spurs. Forewing with the second subcostal vein arising after the fifth; both wings with the discocellulars separately curved, resulting in an angle at the point of origin of the second radial.

A small Indo-Malayan genus, scarcely entering the Palearctic Region.

C. pannosa Moore (= *lyra* Swinh.) (2 b). Bright green with purple-brown marginal line and lighter *pannosa*. purple-brown fringes. Costal edge of forewing narrowly white, then again narrowly purple-brown. Transverse lines broken into irregular series of dots. Forewing with a large purple-brown, white-centred blotch at anal angle, hindwing with a much smaller blotch at apex. Under surface whitish blue-green, with the blotches present but much duller in colour; no other markings. Distributed throughout India and to Burma. The figured specimen is from northern Nepal, in coll. SEITZ. — **incomptaria** Leech, from Wa-shan, West-China, is *incomptaria*. apparently a weekly marked variety or aberration, but as only Leech's type specimen is yet known, and this is not in perfect condition, it is possible that it may prove to be purely a synonym. The species is in any case somewhat variable in the size of the blotches.

18. Genus: **Comibaena** Hbn.

Palpus with second joint long, rough-haired above and beneath, third joint in ♀ moderate to long. Antenna in ♂ strongly pectinate, in ♀ somewhat variable, very rarely pectinate. Hindtibia nearly always with hairpencil and terminal process, the latter often fully half as long as tarsus. Abdomen not crested. Frenulum in ♀ rudimentary or wanting. Forewing with subcostals variable, first radial usually stalked, first median occasionally stalked. Hindwing with distal margin smooth or nearly so, usually well rounded, second subcostal stalked, first median extremely variable in position. — Larva very rugose, a strong lateral flange, special hooked processes to which are attached fragments of leaf, almost entirely concealing the larva. Feed on various trees or bushes. The genus is a large and evidently natural one, notwithstanding a good deal of variability in neuration. The palpus is always characteristic, the hindleg structure nearly always, and even the shape and coloration are generally very recognizable. The species are generally of a very beautiful bright green (though liable to fade), more or less adorned with blotches of reddish, or at the least with red marginal line; the under surface usually shaded with whitish and more delicate green. The eastern Palearctic and the Indo-Australian Regions are the richest in species, but western Europe produces one species and Africa a few.

C. pulchra Stgr. (3 a) is smaller than most of its group, and very distinct in the extended brownish-white *pulchra*. marginal patches of both wings, which are broadest in the middle of the wing. The lines on forewing are indicated chiefly by spots at the margins, the hindwing (as in the allied species) is without lines. The under surface also shows the pale marginal patches, and on each wing a dark discal dot as distinct as above. Palestine.

C. pustulata Hufn. (= *bajularia* Schiff. = *ditaria* Fab. = *glaucia* Geoff.) (2 b). Bright green very finely *pustulata*. and inconspicuously strigulated with white. The lines fine, white, present on forewing only; antemedian becoming thicker and dentate towards inner margin, postmedian running into a reddish-brown, partly white-margined blotch at anal angle. Hindwing with an irregular distal bordering of white spots or small patches, marked with red-brown, that at anal angle the largest; marginal line red-brown. Under surface paler, almost unmarked, a somewhat paler anal blotch on forewing. The larva feeds on oak, hibernates small, and may be beaten from the higher branches in the spring, but is easily overlooked on account of its covering, which makes it look exactly like a tiny bunch of dead leafage. So long ago as 1797 one of the authors of the „Vienna Catalogue“ (DENIS) gives us an interesting paragraph on the protection of this larva, and asks: „Has Dame Nature by

special favour given this species a disguise in order the better to secure it in the larval stage against the birds and ichneumons?" The pupa is brown, the surface dull and rugose, the dorsal area of the posterior abdominal segments bearing numerous flattened spines, pointing backwards; spiracles large and dark; anal armature consisting of four strong, scythe-shaped, spirally curved hooks. The moth appears in June and July, and flies at about sunset on the edges or along the glades of woods, usually at a considerable height above the ground. The range of variation is not great, but the markings vary in extent. Central and Southern Europe, Asia Minor.

neriaria. **C. neriaria** *H.-Sch.* (2 b) differs from *pustulata* in the longer palpus, the very short stalking of the second subcostal of hindwing and some other details of structure; also in the presence of a white, red-margined dorsal spot on second abdominal segment, the reduction of the marginal blotches and the angulation of the postmedian line. Underside rather variable, that of hindwing often nearly white. Occurs from Greece to Armenia. Is very inexcusably treated by STAUDINGER as a variety of *pustulata*.

procumbaria. **C. procumbaria** *Pryer* (= *vaga* *Btlr.*) (2 b). Similar to *neriaria*, but with the lines almost obliterated, the spot at anal angle of forewing rather larger, enclosing one white spot (not, as in *neriaria*, two), hindwing with a rather large apical blotch, its white centre intersected by red on the veins. Shanghai and Japan, also once taken at Omei-Shan. Appears in June.

tenuisaria. **C. tenuisaria** *Graes.* (3 c). Nearly related to the two preceding, especially to *procumbaria*, with which it nearly accords in the blotches. Lines present, formed about as in *neriaria*, abdomen with dorsal spot as in that species, followed by a smaller white one on the third segment. Crown of head green, not white as in *neriaria*. The larva feeds on *Quercus mongolica* in June, but has not been described. The moth flies in July, and inhabits South-east Siberia.

amoenaria. **C. amoenaria** *Ob.* (2 c) is again similar, but has the postmedian line more oblique, running nearer to the anal angle, and the marginal blotches reduced to a pair of small reddish spots at the anal angle of the forewing and a similar pair at the apex of the hindwing. The species was first taken on the Isle of Askold, and occurs in the same district as *tenuisaria*, and also in Japan. It flies in July.

tancrei. **C. tancrei** *Graes.* (3 a). A very distinct species, although structurally quite closely related to the preceding group. It is at once distinguished from all the other species by the course of the white lines, the antemedian being broad and oblique outwards, the postmedian curved so as to approach the antemedian on the posterior (inner) margin, where the two are connected by a white line. This species is confined, so far as is at present known, to the Amur and Ussuri districts.

obsoletaria. **C. obsoletaria** *Leech* (2 a). Distinct from all the preceding in that there are no marginal blotches, the pale fringe being merely preceded by a red-brown marginal line. The postmedian line is bent near the costa but less angularly than in *neriaria*. Kiushiu in June.

striataria. **C. striataria** *Leech* (2 c) is more thinly scaled and is conspicuously striated with silvery white. Otherwise without markings. Under surface whiter. Che-tou, West China.

delineata. **C. delineata** *Warr.*, in which likewise the wings are strigulated with silvery, has the lines present on the forewing, usually yellowish, in part edged with reddish, the postmedian retracted along second median vein, but is further characterized by having a pale pink blotch and some black dots at anal angle of hindwing. Originally described from Sikkim, but occurs also in Tibet.

apicipicta. **C. apicipicta** *Prout* (3 c). Wings of the same green as in *delineata*, and similarly strigulated with silvery; wholly without lines. Forewing with minute black discal dot and dull reddish marginal line, fringe yellowish green. Hindwing with the discal dot sometimes larger, marginal line becoming black apically (interrupted at vein-ends) and accompanied proximally, between second subcostal and first radial, by a small, bright pink blotch. Under surface much whiter, without the pink blotch. Yatung, Tibet. Type and two others (all ♂♂) in coll. Brit. Mus. Certainly a near relative of *delineata*.

argentataria. **C. argentataria** *Leech* (2 b). Bright green, forewing with two silvery white lines, the antemedian bi-curved, the postmedian irregular, expanding into a broad dentate mark at inner margin, followed by a red-brown blotch at anal angle, a dark discal dot ringed with white. Hindwing with discal mark elongate, a white sub-marginal line of irregular course, followed, especially towards apex, by red-brown blotching; cell-mark large, elongate. Underside of forewing without antemedian line; of hindwing silvery white, with a red-brown patch at apex

a dark discal dot and a wavy green postmedian line. Hondo, Kiushiu, Korea and Central China, apparently throughout the summer.

C. nigromacularia *Leech* (= *delicator* *Warr.*) (3 c). Cell-spots rather large, postmedian white line of forewing rather thick, well removed from distal margin, followed by a white cloud running to the margin between the second and third radials, a reddish cloud on inner margin and a somewhat interrupted white submarginal line. Hindwing with a large reddish or dark purple-brown patch at apex, continued more narrowly along distal margin to middle of wing. Underside nearly white, except costal half of forewing; cell-spots large, apical markings of hindwing fuscous, divided into three or four small blotches, separated by the veins. West China, S. E. Siberia and Japan, occurring continuously from June to October. Varies a little in the exact form and extent of the blotches. *nigromacularia*.

C. ornataria *Leech* (2 c). Green strigulated with white. Lines placed nearly as in *delineata*, but slender, white, the postmedian scarcely traceable beyond the bend at second median vein, being followed by a red, paler-centred pyramidal marking on inner margin. Hindwing with the fringes largely purple-red and small paler-centred blotches of this colour at apex and anal angle. Hindwing beneath whitish; marked with green, both wings with thick purple-red streak from inner margin close to anal angle. Only known from Pu-tsu-fong, Western China. *ornataria*.

C. diluta *Warr.* (= ? *ingrata* *Wilem.*) (3 b). A rather obscure species, of which I have seen no certain example excepting WARREN's somewhat faded type, although I believe an Ussuri ♂ in coll. PÜNGELER may safely be referred to it, probably also WILEMAN's (damaged) type of *ingrata*. The green ground colour is not noticeably strigulated with white, the white lines are present, though very indistinct, the postmedian quite near the distal margin, cell-spot small, no terminal red line. Under surface whitish green, with only the cell-spots present. Kiushiu, ? Nikko, ? Ussuri. We here figure Herr PÜNGELER's specimen. *diluta*.

C. quadrinotata *Btlr.* (5 a) in common with a few Indo-Australian species differs from the preceding *quadrinotata* group in neurulation, the fifth subcostal vein arising before the second. These species constitute, approximately, the genus *Probolosceles* of WARREN, but as *procumbaria* varies in the relative position of these two veins, the genus is untenable. *quadrinotata* is smaller and of a rather more delicate build than the *pustulata*-group, to which otherwise it bears a good deal of resemblance; colour somewhat less bright, the white lines indistinct, placed somewhat as in *neriaria*, the postmedian waved; blotches fuscous, not red-brown, enclosing no white scales, consisting of one at anal angle of forewing, one at apex of hindwing and a small dorsal one on abdomen. Dharmala and Kashmir. The species from Talaut, recorded by MEYRICK as *quadrinotata*, is distinct though allied.

19. Genus : **Culpinia** *Prout*.

Face smooth. Palpus shortish or moderate. Antenna in ♂ bipectinate, in ♀ subserrate. Hindtibia in ♂ with small hair-pencil and only two spurs, in ♀ with four spurs, the proximal pair often weak, sometimes almost vestigial. Abdomen not crested. Frenulum in ♂ rather weak, in ♀ wanting *). Forewing with distal margin straight or even slightly incurved anteriorly, strongly oblique posteriorly, third discocellular deeply incurved, becoming very oblique, first subcostal free or anastomosing with costal, first median connate or short-stalked. Hindwing with distal margin toothed at first radial, and more strongly at third, excised between, cell short, costal anastomosing with subcostal at a point near base, second subcostal short-stalked, first median connate, or oftener stalked. Differs in several characters from *Thalera*, with which, on account of its superficial appearance, it has hitherto been confused. Only one species is known.

C. diffusa *Walk.* (= *crenulata* *Btlr.* = *rufolimbaria* *Hed.*) (2 c). Green with an indistinct fine waved whitish postmedian line, forewing also with faint traces of an antemedian. A red line on distal margin, the fringes white, chequered with red. Underside similar. The species bears much superficial resemblance to a miniature *Thalera fimbrialis*. Its range extends from Japan to western China. There are evidently two broods, May to June and August to September. *diffusa*.

*) From here onward to the end of this subfamily, according to the classification which I have adopted, the ♀ frenulum is wanting, and that of the ♂ more or less short and weak, arising from before a marked basal expansion of the hindwing. The structure will therefore not be again mentioned, except under the first genus (*Euchloris*) in which the ♂ also has entirely lost the frenulum.

20. Genus: **Gelasma** Warr.

Palpus moderate, third joint in ♀ sometimes long. Antenna in ♂ pectinate, in ♀ nearly simple. Hind-tibia in ♂ dilated, with hair-pencil. Abdomen not crested. Forewing with first subcostal usually free, first median not stalked. Hindwing elbowed or usually tailed (sometimes strongly) at end of third radial, second subcostal stalked, first median shortly stalked. Of the early stages we have as yet no information. The genus is chiefly Indo-Australian, and does not reach Europe.

glaucaria. **G. glaucaria** Walk. (2 c). Grey-green, rather thinly scaled, the colour composed of dense irroration of greyish olive on a whitish ground. An irregularly bent, elongate cell-spot on each wing, two lines on forewing and one on hindwing, all produced by a thickening of the darker scales; the postmedian line accompanied distally by a vague pale line. Underside almost white, somewhat opalescent. Northern India and Tibet.

flagellaria. **G. flagellaria** Pouj. (= *flagellata* Pouj. i. tab. = *albistrigata* Warr.) (3 a). is slightly greener than the preceding, both on the upperside and on the forewing beneath, the markings on an average even weaker, the cell-mark less bent. Otherwise the two are extremely similar. Central and western China.

ambigua. **G. ambigua** Btlr. (2 c) is still somewhat more green in colour, the darker markings consequently obliterated. The white postmedian line on both wings is finer, and more strongly dentate. In addition the hindwing is somewhat more elongate, and the ♂ antennal pectinations are longer. Japan, in July.

illitirata. **G. illitirata** Walk. (2 d) and the species which follow may be distinguished from the preceding ones by the longer, sharper tail of the hindwing, and have, on that account, sometimes been treated as forming a separate genus, *Thalerura*. The present species is of a dull green, about as *ambigua*, both wings with a very slightly darker cell-mark and a strongly dentate postmedian white line, no dark marginal line. Under surface whitish, unmarked. Perhaps a form of the Indian *dissimulata*. Described from Shanghai, also occurs in Japan (common at Yoshino, end of June and early July) and Korea.

protrusa. **G. protrusa** Btlr. (2 d) is perhaps of a slightly brighter green colour than the preceding, of which, however, I have seen no really fresh specimens. Its size is somewhat smaller than that of *illitirata*, its under surface more tinged with green (particularly on the forewing), but it is best distinguished by having a blackish marginal line, interrupted at the ends of the veins. Distributed in Japan, and occurs also in Amurland.

grandificaria. **G. grandificaria** Graes. (= *colataria* Leech) (2 d) is again similar to the two preceding species, especially to *protrusa*, which it resembles in having the dark marginal line. LEECH separated it from the last-named by its chequered fringes, and these are very noticeable, but as those of *protrusa* are also very faintly chequered this is not the best distinctive character. *protrusa*, besides being generally smaller, has in the ♂ shorter antennal pectinations and in both sexes longer palpi. *grandificaria* is found in Amurland and Japan and is distributed right across China from Ningpo to Mou-pin. As I have not seen Amurland specimens, it is just possible that I am uniting two different species, but GRAESER's excellent description quite agrees with *colataria*. The Japanese specimens which I have seen were taken in June and August.

submacularia. **G. submacularia** Leech. Shape about as in *protrusa*, the distal margin of the forewing being straight. Larger than that species, colour a very dull grey-green, dark marginal line more continuous, under surface marked with a large dark patch at anal angle of forewing and another at apex of hindwing. Antennal pectinations in the ♂ much shorter than in *protrusa*. West China: Mou-pin and Omei-shan, in June.

21. Genus: **Oenospila** Swinh.

A small Indo-Australian genus, distinct from *Gelasma* chiefly in the hindtibia of the ♂, which is greatly thickened and lacks the terminal spurs, the proximal pair being very unequal. The coloration is bright green, very distinct from the dull greyish or glaucous shades of *Gelasma*.

strix. **O. strix** Btlr. (2 c). Bright green with the costal edge of the forewing snow-white; the lines indicated by reddish dots or dashes on the veins, a row of reddish spots at base of fringe and on the hindwing a rather large blackish blotch on the inner margin, which distinguishes it from *flavifusata* Walk., the type of the genus. Hindwing elbowed at the end of third radial. Underside very pale green, unmarked, fringe as above. First described from Dharmasala. Just enters the Palearctic Region in Kashmir. Occurs also in Assam.

22. Genus: **Hemithea** Dup.

Palpus with third joint in ♀ elongate. Antenna in both sexes ciliated. Hindtibia in ♂ long, with a sheath enclosing a hair pencil and with only one pair of spurs, in ♀ with all spurs, hindtarsus in ♂ abbreviated. Abdomen crested. Forewing with first subcostal usually free, first median occasionally stalked. Hindwing bent or shortly tailed at end of third radial, costal anastomosing at a point with subcostal, second subcostal and first median both stalked. — The egg is a flattened disc, with the usual hexagonal pattern. The larva is slender, very firm and twig-like, the head and prothorax deeply bifid, the body rough, with white spicules, but without marked protuberances, a lateral flange well developed. Although it does not possess the special tubercles or clothing of *Comibaena*, it is said to have a habit, in early life, of covering itself with threads, to which particles of dust and dirt adhere. — The genus is Palearctic and Indo-Australian.

H. aestivaria Hbn. (= *strigata* Müll. nec Scop. = *thymiaria* Schiff. nec Linn.) (2 d). Green, the costa *aestivaria*. of the forewing speckled with brown, both wings with a subdentate whitish postmedian line which is slightly dark-shaded proximally, forewing also with an antemedian line, fringes dark-spotted. Under surface whitish green, unmarked. The egg has not been fully described. It is shaped as indicated above, in our generic diagnosis. The larva is very variable in colour, green, brown or purplish, with a dark dorsal line widening into dorsal triangles which are in part margined with white. It is polyphagous, though with a preference for trees or bushes, oak, hawthorn and willow being a few of its favourites. It hibernates small, and is full fed about the beginning of June. The pupa is slender, light-brown, with a dark dorsal line, and rests in a slight cocoon among leaves. The moth flies in July and early August, and is locally common in a great part of the Palearctic Region from North-east Spain to Japan, though avoiding the high latitudes. It prefers wooded country or thick hedges, and is easily disturbed by day from its resting-places among the foliage. In the evening it flies vigorously, and is sometimes attracted to flowers or artificial sweets. It varies much in size, the Japanese specimens in particular being much larger than the Western ones, but it is otherwise very constant. — **alboundulata** Hed., described from a *alboundulata*. single example from Amurland, is somewhat problematical, but almost certainly a rare casual aberration of this species, with the lines unusually approximated.

H. ussuriaria Brem. (2 d). Light green, with the usual white lines waved, but not dentate, the ante- *ussuriaria*. median indistinct; the antemedian is accompanied distally, and the postmedian on both wings proximally by a dark green line. Under surface paler. Occurs from the middle of June to the beginning of August in Amurland and north-eastern China.

H. nigropunctata Warr. (2 d) was described from northern India, but specimens in coll. PÜNGELER from *nigropunctata*. Nikko, Japan (formerly identified as *amphitritaria*) agree so accurately with it that I have little hesitation in adding it to the Palearctic fauna. It is of a rather brighter, less opaque green than *aestivaria*, with less pronounced tail to the hindwing, and with a conspicuous black discal spot on each wing; fringes unspotted; abdomen dorsally darker, more variegated (red and fuscous). We have copied Warren's figure, but the costal margin should be speckled with black.

H. distinctaria Walk. (2 d). Bluer green than either of the preceding, shape about as in *nigropunctata*. *distinctaria*. Readily distinguished by the postmedian line, which is fine, clear, on the forewing straight and not waved or dentate (parallel with distal margin), on the hindwing only very slightly bent opposite to the angle in the distal margin. Abdomen dorsally marked with fuscous, the crests small, fuscous. Described from Sikkim, where it appears to be common, but extends also into Tibet.

H. confusaria Stgr. (5 a) from Amurland, was described by comparison with *pretiosaria* (*Chlorissa*), *confusaria*. from which the much longer and stronger antennal cilia of the ♂ separate it. But according to a cotype kindly lent us for figuring, it is certainly a *Hemithea*, with strong abdominal crests and closely related to *distinctaria*. Abdomen dorsally pale reddish brown, not fuscous. Postmedian line denticulate, less straight.

H. marina Btlr. is a smaller, more delicate species, reminding of an *Iodis*. Abdominal crests *marina*. weak, but present. The white lines are present but rather faint, their course nearly as in *aestivaria*, from which *marina* differs in its smaller size and unspotted fringes. I have not seen any perfect specimens, and cannot say positively that it may not prove to be a form of *ussuriaria*. Japan and perhaps Korea.

23. Genus: **Diplodesma** Warr.

Characters of *Hemithea*, but abdomen not crested, first subcostal arising from the stalk of the others, beyond first radial, usually running into costal. In the name-type of the genus, *celataria* Walk., the second

subcostal also runs into the costal, but this vein is very variable in the genus, and sometimes wanting. The species are of small size, broad-winged, with very glossy scaling, sometimes thinly scaled and more or less translucent. The typical species are all Indo-Australian, and the only two Palearctic species which are best referred here (on account of the stalking of the first subcostal) are somewhat anomalous, having more the shape and facies of a *Hemithea* or *Chlorissa*. They might possibly be treated as aberrant, tailed *Chlorissa*.

mundaria. **D. mundaria** *Leech* (2 e). Pale yellowish green (perhaps faded), the lines rather straight, whitish, the first dark-edged distally, the second proximally; the second is as usual continued on the hindwing. Hindwing with an elongate darker green discal mark. Under surface greenish white, without markings. West-China: Ta-Chien-Lu in June.

eluta. **D. eluta** *Wilem*. Smaller and with broader forewing than *mundaria*, more nearly approximating to some of the typical *Diplodesma*, such as *obnupta*. Slightly darker than *mundaria*, the lines somewhat more distinct, that of hindwing less straight. The less straight lines will also distinguish it from *obnupta*. Distributed in Japan, occurring from June to September. Also in Korea.

24. Genus: **Chlorissa** *Steph.*

Perhaps scarcely more than a subgenus of *Hemithea*, being somewhat connected by intergrades. The abdomen is usually not crested, and never has more than two small crests. The distal margin of the hindwing is either entirely rounded or at most quite weakly elbowed. Most of the other distinctions which separate the typical members of the two genera prove quite inconstant when wide material is investigated. The early stages of *Chlorissa* are similar to those of *Hemithea*. The geographical distribution is very wide, representatives occurring throughout the Palearctic Region, India, East and South Africa and North America. The genus is generally called *Nemoria*, a name that rightly belongs to the North American *bistriaria* *Hbn.*, which has no connection with the present group.

viridata. **C. viridata** *L.* (= *prasinata* *Wrnbg.*) (2 e). Wings green, forewing with the costal edge yellowish and with two whitish transverse lines. Hindwing weakly angled at end of third radial, the margin straight, or even very slightly excised, from here to first radial, colour as in forewing, with a single, little bent transverse line. *caerulescens*. Under surface somewhat paler, with the postmedian line only, sometimes almost unmarked. — ab. **caerulescens** *Burr.* is of a bluer green colour. — ab. **conca-**
vilinea has the postmedian line on hindwing incurved. — ab. **conca-**
olivaceo- **vilinea** *Burr.*, which is probably scarcely worth distinguishing,
marginata green. — ab. **olivaceo-**
rufotincta has all the fringes dark olive-
mathewi green. — ab. **rufotincta** *Burr.* has a delicate red flush on the centre of the forewing. — ab. **mathewi** *Banks*
rosearia is described as having the wings pale rosy throughout. The last three aberrations, though founded on fresh (in part even on bred) specimens, are probably due to some subtle chemical action on the fugitive green colour. —
melinaria. — **melinaria** *H.-Sch.*, described from a single example from the Ural, is a somewhat enigmatical form, but seems best referred as an aberration to *viridata*, which in any case occurs about Orenburg, in a form which I cannot differentiate from that of western Europe. *melinaria* is smaller than the type form, more bluish, with the lines more nearly approximated. There is in the British Museum a specimen bred by ZELLER, and labelled by him as *melinaria*, agreeing with the above description, but unfortunately without locality. It is very doubtful whether some other specimens which have at times been identified under this name really belong to it. —
insignata. **insignata** *Stgr.* (5 a) from Turkestan, is distinguished by the scarcely elbowed distal margin of the hindwing and the almost obsolete white lines. The egg of *viridata* is similar to that of *Hemithea*. Larva also similar to *aestivaria* but of simpler structure, lateral flange less developed; green, with reddish dorsal line or diamond-shaped spots, partly edged with white. Feeds on hawthorn, sallow, heath, *Potentilla* and various other plants. Pupa pale brown, with blackish dorsal line and spiracular spots, hibernating in a slight cocoon among fallen leaves. The moth appears in May and June, and is locally common, resting by day among low plants or bushes, and becoming more active in the afternoon. Its range, so far as is ascertained, embraces most of temperate Europe, Asia Minor, Armenia, etc., and perhaps some localities in Central Asia; but it has been much confused with some of its nearest relatives.

cloraria. **C. cloraria** *Hbn.* (= *porrinata* *Z.*) (2 e). Very closely related to the preceding, being scarcely distinguishable except in having the costa and front leg more or less thickly spotted with fuscous. The ground colour is perhaps on an average slightly more bluish, and the postmedian line more curved. Structurally also, BÜRRROWS (in litt.) tells me that the ♂ genitalia differ in that the „socii“ (two organs which lie alongside the uncus)

appear in *cloraria* much narrower and the „vinculum“ („saccus“) less wide, the central portion less extended anally. The figure of *cloraria* given by HÜBNER is unsatisfactory, and has given rise to many uncertainties, but its dark costa and the curve of the postmedian line (though exaggerated) show that it is intended for the present species. This was pointed out long ago by ZELLER, and the name ought to be restored. — ab. *rosea* *rosca*. *Gumpp.* is a form with the ground colour more or less changed to rosy, as in some of the *viridata*-forms described above, and no doubt attributable to a like cause. — The larva of *cloraria* is said to be reddish, not green, and to feed on various plants in June and September, the moth occurring in two generations, May and July to August. The geographical range of the species is not precisely ascertained, but it is certainly common in some parts of Southern and Southern Central Europe, and perhaps also reaches Armenia.

C. obliterata *Walk.* (2 e) very closely approaches the two preceding, and is probably the species recorded *obliterata*. by STAUDINGER and others from the eastern Palearctic Region as *viridata*. The colour is slightly more yellowish, the scaling perhaps somewhat smoother, the postmedian line of the forewing somewhat differently formed, and the abdomen has two or three anterior segments dorsally coloured red. Shanghai to Japan and Ussuri. The *obliterata* of LEECH is probably *amphitritaria*, certainly not the present species.

C. pulmentaria *Guen.* (= *cloraria* *Dup.*, nec *Hbn.*) (2 e) has sometimes been confused with the preceding *pulmentaria*. group, but is very distinct in the rounded hindwing, longer palpus, wings finely strigulated with whitish, and other characters. The white lines are seldom sharply expressed; that of the hindwing is bent. — **palaestinensis** *palaestinensis*. *Fuchs*, from Syria, is smaller, the white lines obsolete or extremely faint. According to PÜNGELER (in litt.) FUCHS' actual types belonged not to *pulmentaria* but to *faustinata*, but as I possess a long series from Syria agreeing entirely with his description and referable, in my opinion, to *pulmentaria*, I hesitate to transfer the name at present. If they are really referable to *faustinata* they represent a very different form from the Spanish, there being no trace of dark lines, though some specimens show a very faintly darkened cell-spot. — The larva of *pulmentaria* is even more slender than those of its allies, green and yellow or whitish (adaptive to the colour of its food-plant) with a broad, dull carmine dorsal line. It feeds on various Umbelliferae, but will also accept plants belonging to other orders, and is easy to rear, feeding up very rapidly in the summer. Pupa slender, greenish-grey; wing-cases dark-veined; dorsal line and spiracular spots black. The moth is double-brooded, and is locally common from southern Europe to Central Asia.

C. faustinata *Mill.* (? = *palaestinensis* *Fuchs*) (2 e). Nearly related to *pulmentaria*, but with the lines *faustinata*. indicated (usually rather obscurely) by a darker green shade than the ground-colour, a very faint darker green discal spot usually present on each wing. Egg, according to MILLÈRE, azure blue. Larva slender, cylindrical, dull bluish green, with a more or less vinous, interrupted dorsal line, partly divided into white-encircled spots. Feeds on *Rosmarinus officinalis* in a succession of broods. Pupa greenish, dark-spotted, the wing-veins dark. Occurs in Spain and Syria, and is perhaps not specifically distinct from the widely-distributed African *stibolepida* *Btlr.*

C. amphitritaria *Ob.* (2 e) has the hindwing somewhat angled, approaching the normal *Hemithea* form *amphitritaria*. the second to fourth abdominal segments red dorsally. Distinguished by its delicate, translucent sea-green colour, the costa of the forewing pale yellow, both wings with dark green cell-spot, the antemedian white line weak, the postmedian sinuous, parallel with distal margin. Occurs on Askold in June and July, also in the Ussuri district and Japan.

C. pretiosaria *Stgr.* (= *gelida* *Btlr.*) (2 c). Rather recalls *Hemithea distinctaria* except in the absence *pretiosaria*. of dorsal pattern or crests, but is of more slender build, lighter, less bluish green, the postmedian line on the forewing usually obsolescent towards the costal margin, on the hindwing even straighter than in *distinctaria*. The typical form is relatively small, with the antemedian line usually absent. — **gigantaria** *Stgr.* (= *anomala* *gigantaria*. *Warr.*) is a much larger form, with the antemedian line present. It seems to be a local race, but its distribution is so mixed up with that of the type, that until more precise information is available as to altitudes or other

local conditions it is difficult to disentangle it. The typical form has a wide range from Transcaucasia to North-west India, and WILEMAN has recorded a single specimen from Yoshino, Yamato, Japan. The form *gigantaria* occurs in a part of Ferghana, in Kulu, Goorais Valley, Scind Valley, about Dalhousie, and I have seen one example from Huang-mu-chang.

plana. **C. plana** Wilem., of which only a single ♀ is known, and which is somewhat doubtfully referable to this genus, is of about the size and shape of *viridata*, of a rather opaque, uniform green, without a trace of lines. Fringes pale. Underside similar. Antenna thick and serrate, palpus probably too short for a *Chlorissa*. Japan: Odai-San, Yamato, July, 1894.

25. Genus: **Neromia** Stgr.

Palpus with third joint short, nearly alike in both sexes. Antenna evenly ciliated. Hindtibia with only one pair of spurs, tarsus not abbreviated. Abdomen not crested. Hindwing with distal margin rounded. Neuration as in *Hemithea* and *Chlorissa*. Evidently related to the genera just named, but differing in the palpus (at least of the ♀) and in the leg structure. Only the type species, *pulvereisparsa*, clearly belongs to the genus, but one Indian and a few African species with still shorter palpus can be provisionally referred to it.

pulverei-
sparsa. **N. pulvereisparsa** Hmps. (= *iodisata* Stgr.). (3 a) Light ochreous grey or greyish ochreous, more or less densely dark-dusted. Lines lunulate-dentate, whitish, quite weak or almost obsolete, sometimes made more prominent by a slight darkening of the central area of the wing. Discal marks feebly indicated. Under surface paler, unmarked. Aden and Palestine. HAMPSON's type, from the former locality, is much darker-dusted than the Palestine specimens (*iodisata*) which I have seen, and the specific identity not quite certain, all being in bad condition.

carnifrons. **N. carnifrons** Btlr. (= *indecretata* Hmps. nec Walk.) (2 i). Palpus minute, ♂ antenna dentate, with fascicles of cilia. Wings somewhat ampler than in *pulvereisparsa*. Delicate sea-green, costal edge yellowish white, both wings with a nearly straight, moderately thick white postmedian line. Underside slightly paler, otherwise quite similar. Distributed through India from the Nilgiris to the Himalayas. The specimen figured, *rectilinearia* from Kulu, is in the BASTELBERGER collection. — **rectilinearia** Leech, from Huang-mu-chang, scarcely differs, but has a weak, curved antemedian line on forewing of which there is not or hardly a trace in *carnifrons*.

26. Genus: **Microloxia** Warr.

Palpus moderate to long, third joint in ♀ elongate. Antenna in ♂ pectinate. Hindleg in both sexes with only one pair of spurs. Abdomen not crested. Forewing with first subcostal anastomosing with or running into costal, second subcostal sometimes running into costal, sometimes anastomosing with first subcostal, first median sometimes stalked. Hindwing with distal margin rounded, second subcostal and first median both stalked. Larva more or less slender, tapering anteriorly, head small, the lobes produced to points, body rugose, granulated, lateral flange developed.

A small genus inhabiting southern Europe, India and Africa. Perhaps it will need further subdivision. The species are not all uniform in shape and facies, while even in structure there are some slight variations. The species of the typical section are of very small size, but relatively strongly built.

herbaria. **M. herbaria** Hbn. (= *graminaria* Z. = *bruandaria* Mill.) (2 e) is the name-type of the genus, and the best-known species. The green ground-colour is never very bright, and easily fades to a dirty olivaceous shade. The lines are slender, rather straight, almost wanting on the underside. The fringes are long, distally pale. *advolata.* — In the form **advolata** Ev. (2 e), which seems inclined in some localities to form a local race, but in others is a mere aberration, the lines are broader and clearer, hence much more conspicuous, and are perceptible also beneath. — The larva is pale green, sometimes with an olive-green or red-brown dorsal line. Feeds on *Teucrium* and produces two or more generations in the year. The species occurs in southern Europe, Syria and Asia Minor and eastwards to Turkestan.

halimaria. **M. halimaria** Chrét. (2 e) apparently replaces *herbaria* in Algeria. It is very closely related to that species, but bluer green, the lines very fine, indistinct, shaded with dark green, sometimes almost obsolete. Egg greenish white, an irregular ellipsoid, truncate at one end, a large central depression, reticulation polygonal. Larva more robust than *herbaria*, granulation more regular, ground-colour more whitish, dorsal pattern different. On *Atriplex halimus*, in a succession of broods.

M. menadiara *Th.-Mieg* is described as of robust build, the ♂ antenna somewhat as in *Ochrognesia menadiara*. *difficta*, face greenish, space between antennae white, wings yellow green, forewing with costa somewhat rosy, the lines consisting only of small white dots on the veins, the postmedian 2 or 3 mm from the distal margin, cell-spots slightly darker green, scarcely noticeable, under surface greenish white, costal edge rosy, palpus and legs rosy white. The type, which was from Bona (Algeria) in coll. VALLANTIN, is unfortunately lost, but its author possesses a drawing of it and there is a ♀ from Philippeville in coll. PÜNGELER which may probably belong to it. If so, the ♀ antenna is pectinate, the tongue weak, the first subcostal of forewing free. The species is very much larger than *herbaria*, no doubt related to *saturata*.

M. saturata *Bang-Haas* (2 f). Antennal shaft red, pectinations in ♂ of quite moderate length, tongue *saturata*. rudimentary or wanting, forewing with first median arising from cell. Wings rich dark yellow-green, a postmedian white line, continuous except at costa, slightly curved, costal edge of forewing yellowish white. Under surface somewhat paler and yellower, without the line. The palpus (♂) probably too small for a true *Microloxia*. First discovered in Algeria. One in coll. PÜNGELER was taken in Murcia together with *herbaria*.

27. Genus: **Hierochthonia** *Prout*.

Palpus minute. Tongue wanting. Antenna in ♂ bipectinate to apex, with rather long branches; in ♀ shortly pectinate (except in *petitaria*). Hindtibia with a single pair of spurs. Abdomen not crested. Forewing with first subcostal arising from cell, anastomosing with or running into costal, first median arising close to end of cell. Hindwing with distal margin rounded, cell not short, costal anastomosing (in *alexandraria* approximated) to near end of cell, second subcostal stalked, second radial from scarcely above middle of cell, first median stalked or separate. Related to *Microloxia*, but differing in the minute palpus, strong anastomosis of costal vein of hindwing, etc. Only three species are known, all eastern Palearctic; and one of these, *alexandraria*, is not strictly congeneric, but must ultimately be removed, on account of the position of the costal vein of hindwing.

H. pulverata *Warr.* (= *semitaria* *Püng.*) (2f, 2i). Superficially exceedingly like *Xenochlorodes beryllaria*, *pulverata*, with which it is often confused; but differing structurally in the absence of tongue and presence of ♂ frenulum, pectination of ♀ antenna, and in the somewhat longer wings. Only known from Syria.

H. petitaria *Christ.* (2 f) is larger, longer-winged, of a less bright, more yellowish green, entirely without the white postmedian line. Described from Askhabad, and since found in a few other localities of Transcaspia and Ferghana, but still very rare in collections.

H. alexandraria *Prout* (3 b). Very similar in aspect to *petitaria*, forewing somewhat narrower, costa somewhat straighter, ♀ antenna pectinate, wings less yellow green, unicolorous, forewing with first subcostal anastomosing at a point with costal, hindwing with costal merely approximated to cell, not anastomosing. Alexander Mountains, Central Asia. Type (♀) in coll. PÜNGELER.

28. Genus: **Euchloris** *Hbn.*

Palpus strong, second joint long, rough-haired above and beneath. Tongue short and slender. Hindtibia with all spurs. Abdomen not crested. Forewing with first subcostal sometimes anastomosing with costal. Hindwing with second subcostal arising from a point with first radial, or shortly stalked. In this and all succeeding genera of the subfamily, the frenulum is wanting in both sexes. Egg of a short, broad oval shape, much flattened at each side, the surface covered by a fine hexagonal reticulation. Larva moderately stout, rugose, with marked lateral flange, and with special tubercles bearing, in early life, hairs with crescent-shaped tops, in later life, stout conical spines and horny hooks, to which, by means of silken threads, particles of the food plant are attached to form a covering for the larva, much as in *Comibaena*; spiracles large, with raised chitinous walls. Pupa rugose, shagreened, spiracles very large and prominent, anal segment prolonged dorsally above the anus, bearing a small group of longish spines, ending in spirally curved hooks. The genus is chiefly Palearctic, though containing also one Indian species.

E. smaragdaria *Fab.* (2 f). Bright green, costal edge of forewing yellow, lines whitish, the antemedian *smaragdaria*. bicurved, rather incomplete, postmedian wavy, nearly parallel with distal margin; a round white discal spot.

Hindwing without lines, the green ground-colour shading off to whitish towards costal margin and base. — In ab. *obsoleta* Burr. the discal spot is wanting. — In ab. *alineae* Burr. (? = *immaculata* Thunb.) the white lines are entirely absent. — ab. *unilinea* Burr. possesses the postmedian line only. — ab. *caeruleo-viridis* Burr. is of a decided blue-green ground-colour. — ab. *viridis* Burr. is of an unusually vivid green. — *gigantea* Mill. (= *castiliaria* Stgr.) is a very large form from Castile and Aragon with the lines indistinct or wanting. — In Britain the larva feeds only on *Artemisia maritima*, and is confined to salt marshes; on the continent its habits and foodplants are more varied. It has a wide range in Europe and perhaps in Asia, but the Asiatic material which I have seen is referable to *prasinaria*.

prasinaria. **E. prasinaria** Ev. (= *volgaria* Guen.) (2f) is very usually regarded as a form of the preceding, but I incline to the opinion of MILLIÈRE and a few others, that it is a distinct species. It is generally smaller, relatively longer-winged, the transverse lines very broad and very white, the postmedian markedly serrate, the hindwing often more whitish both above and beneath, the distal half remaining greenish, traversed by a distinct white line. It inhabits South-east Russia and has in Asia a tolerably wide range, from Transcaucasia through North Persia and as far eastward as the Uliassutai district. — *mongolica* Stgr. is said to be darker green, the white lines almost twice as broad, the white lines and spot on the underside of both wings also larger and broader. It is only recorded from the Uliassutai district in northern Mongolia, but I have a specimen of *prasinaria* from Amurland agreeing with the description.

chlorophyllaria. **E. chlorophyllaria** Hed. (3b) is of nearly the same colour as *smaragdaria* and *prasinaria*, but very distinct in having the lines straight, not lunulate or denticulate, and in lacking entirely the white discal spot. Occurs in S. E. Siberia, N. China and the Amdo district (S. E. of Koko Nor).

jankowskaria. **E. jankowskaria** Mill. (2f) is extremely near the preceding, to which it has been sunk by LEECH. It is not so entirely grass-green, being more mixed with white scales and having a white patch at the base of the hindwing. According to MILLIÈRE the lines are still straighter than in *chlorophyllaria*. His figure looks slightly shorter-winged. Known only from S. E. Siberia. — *smaragdularia* Stgr. from southern Ferghana is possibly a form of *jankowskaria*, but seems to have longer distal margin and some other slight differences. The antemedian line is usually very weak, sometimes wanting, the discal spot of *smaragdaria* is occasionally traceable, the postmedian line is slightly outcurved. — *viridifrons* Warr., erected on a single specimen from near Dinau (Amu Daria) is probably a strongly-marked form of *smaragdularia*, with the antemedian line and cell-spot distinct.

albocostaria. **E. albocostaria** Brem. (2h) is a very distinct species, easily recognized by the very large, reddish-centred (and often reddish-edged) discal spots or patches, red marginal line and red-spotted white fringes, recalling certain species of *Comibaena*. Common in Japan, occurs also in South-east Siberia. Probably double-brooded.

serraria. **E. serraria** Stgr., founded on a single example (♀) from Transalai, and originally suggested as possibly a variety of *smaragdaria* but more likely a separate species, was later considered by its author to be perhaps a variety or aberration of *plusiaria*. The postmedian line is very strongly dentate, and there is a white submarginal line present which, on the underside of the hindwing, becomes strongly dentate.

plusiaria. **E. plusiaria** Bdv. (2f) bears superficially far more resemblance to an *Aglossochloris* than to *smaragdaria*, the hindwing being in great part white above, while the forewing above and both wings beneath have much broadened, more zigzag white lines and a series of large white submarginal wedge-spots, connected into a zigzag line on the under surface. The species is very local, and confined to Spain and North Africa.

29. Genus: *Aglossochloris* Prout.

Closely related to the preceding genus, differing chiefly in the absence of the tongue and in the hind-tibial armature. This is very remarkable, the ♀ (at least in all the specimens which I have been able to examine, or concerning which I have obtained information) wanting the proximal pair of spurs, while in the ♂ the armature is variable, these spurs being present, but aborted, in *fulminaria*, but absent in the other species. The larval habits are identical with those of *Euchloris*. The genus may be treated as entirely Palearctic, for even the single Indian species inhabits Kulu and other northern localities in that country.

A. fulminaria *Led.* the name-type of the genus, and the longest-known of the species with the *fulminaria*. exception of the Indian *radiata*, inhabits North Persia, Ferghana and a part of Turkestan. It is a handsome species, somewhat larger than its relatives, the strongly zigzag postmedian line very striking. Distal half of hindwing more or less marked with green.

A. correspondens *Alph.* (2 g), besides being appreciably smaller, is readily distinguished by its broader *correspondens*. white markings, the dentition of the postmedian less extreme, by its thicker submarginal interneural wedge-marks and by its mostly white hindwing, which has the second subcostal stalked, whereas in *fulminaria* it is separate. Local in south-western Siberia, about from Samarkand to Kuldja.

A. crucigerata *Christ.* (2 g) is of about the same size as *correspondens*, distal margins somewhat more *crucigerata*. convex the lines similarly formed but the postmedian less broad; the veins are broadly marked with white in the central as well as in the basal area, the median vein broadly so, thus producing, with the discal spot, the characteristic white cross which has given to the species its name; terminal wedge-marks nearly as in *fulminaria*. Palpus (both sexes) considerably shorter than in *fulminaria* and *correspondens*. Transcaspia and North Persia.

A. mabillei *Th.-Mieg* is also similar. Size of the two preceding, lines nearly as in *fulminaria*, veins *mabillei*. white, more as in *crucigerata*, submarginal wedge-marks of forewing rather short, but connected by a thick white marginal line. Hindwing weakly marked, with an irregular white submarginal and a white marginal line; second subcostal short-stalked, as in *correspondens*. Central Asia, according to the labels on the type and co-type; the published locality „bords de l'Amour“, is an error.

A. radiata *Walk.* has the antemedian line outangled on the median vein, then oblique basewards *radiata*. without further bend, the postmedian straight or slightly curved in anterior half, then twice inangled. The hindwing is usually similar to that of *correspondens*, sometimes, however, the white part is more greenish. WALKER's type was merely recorded as from „North Hindostan“. The species has since been taken in Kulu, the Scind Valley and at Huang-mu-chang.

29. Genus: **Holoterpna** *Püng.*

Palpus rather short to moderate. Tongue rudimentary or wanting. Antenna in ♂ bipectinate, with very short branches. Hindtibia in both sexes with a single pair of spurs. Abdomen robust, not crested. Forewing triangular, distal margin very oblique, first subcostal free. Hindwing with inner margin moderately to very long, costal approximated to cell for a moderate distance, second subcostal very shortly stalked. Only two species known, both Asiatic, differing a good deal in shape of hindwing and slightly in several other characters.

H. diagrapharia *Püng.* (3 b) is distinguished by its larger size, shorter inner margin of hindwing, *diagrapharia*. less blue-green forewing, with traces of pale postmedian line, whiter hindwing, etc. In coloration it more approaches *Dyschloropsis*. Transcaspia.

H. pruinosa *Stgr.* (2 g) may be recognized immediately by its peculiarly-shaped hindwing and its *pruinosa*. uniform, pale bluish green colouring, which is only slightly paler beneath. Palestine.

30. Genus: **Dyschloropsis** *Warr.*

Closely related to the preceding genus, from which it differs little except in the shorter palpus, longer antennal pectinations, more slender abdomen, less pointed forewing (distal margin less strongly oblique) and differently shaped hindwing, with longer costal margin and with distal margin incurved between first and third radial. Only one species.

D. impararia *Guen.* (2 g). Forewing yellow green, with a faintly indicated pale postmedian line. Hind- *impararia*. wing whitish green (almost white). Underside of both wings uniform pale yellow-green. A scarce and local species first described from the Ural, but since met with in the vicinity of Lake Zaisan, the Ala Tau Mountains and the Uliassutai district.

31. Genus: **Thalera** Hbn.

Palpus in both sexes quite small. Antenna in both sexes bipectinate, the branches in the ♀ very short. Hindtibia with one pair of spurs. Hindwing and sometimes forewing with the distal margin crenulate and more or less deeply excised from the first to the third radial. Forewing with first subcostal anastomosing with costal, usually also with second subcostal. Hindwing with costal anastomosing with cell at a point, or shortly, near base, second subcostal shortly stalked. — The larva is slender, resembling a small twig or stalk, the head bifid, prothorax with two anterior points, anal extremity with two points. The genus apparently contains only two or three species, although it has in the past been made to include a number of heterogeneous forms. Even *lacerataria* is not very closely allied to *fimbrialis*, the name-type of the genus.

fimbrialis. **T. fimbrialis** Scop. (= *thymiaria* L. = *bupleuraria* Schiff.) (2 g). Green, the forewing with two curved and usually a little denticulate white lines, the hindwing with one, both wings with the fringes spotted with bright brown-red. Varies somewhat in the denticulation of the lines, and in the distance which separates those of the forewing, but is on the whole a rather constant species. — *ab. albaria* Esp. is very much paler, the lines not visible. I have not seen it in nature, and suspect it may be due to fading. — var. *chlorosaria* Graes., from S. E. Siberia and Korea, is of a paler colour than the type, with the white lines broader. — The larva feeds on various low plants in May and June, and is yellowish green with a red dorsal line, which is sometimes broken up into spots, and with head, prothorax and anal extremity tipped with red. The pupa is yellowish white, dorsally red, with a darker medio-dorsal line and dark dots and streaks, wing-cases dark-veined. The moth appears in July and August and is distributed through Central Europe and Central Asia, the typical form reaching as far as Dauria, beyond which it gives place to the var. *chlorosaria*.

lacerataria. **T. lacerataria** Graes. (= *suavis* Swinh.) is readily distinguished by its having the distal margin of the fore as well as of the hindwing excised, the ground-colour light olive-green, the lines darker green, not white and each wing with a large red-brown discal spot. The anterior and distal margins are narrowly brown. Ussuri, Korea, Japan, W. China.

32. Genus: **Hemistola** Warr.

Palpus usually short. Antenna in ♂ and usually in ♀ bipectinate. Hindtibia with all spurs. Forewing smooth-margined, hindwing usually with a small tail or slight elbow at the end of third radial, occasionally fully rounded. Forewing with first subcostal free or briefly anastomosing with costal. Hindwing with costal approximated to cell for short or moderate distance, second subcostal stalked, first median connate, separate or short-stalked. The larva is only known in the case of one of the species, *chrysoprasaria*; it is of moderate proportions, tapering anteriorly, the characteristic projecting points of head and prothorax very strongly developed, body shagreened with white granules, lateral flange developed. Pupa rather slender, tapering, the shell rather thin, cremaster strong and conical, terminating in several hooked bristles. The genus inhabits Europe and Asia, and a few African species are provisionally placed in it.

chrysoprasaria. **H. chrysoprasaria** Esp. (= *vernaria* Hbn. nec L. = *lucidata* Don.) (2 g). Green with the usual white lines, the antemedian of forewing strongly curved and usually with two small, slight teeth directed distad, the postmedian nearly parallel with distal margin, not dentate. Hindwing bluntly elbowed. Varies considerably in the distance which separates the two lines on forewing. — *dentigera* ab. nov. has the postmedian line of forewing dentate, nearly as in *zimmermanni*. — *lissas* Prout replaces *chrysoprasaria* in Central Asia, scarcely differing except in the shape of the hindwing, which is rounded instead of elbowed. The eggs of *chrysoprasaria* are very flat and are laid in piles of 10—14, and being green in colour resemble collectively a tendril of the food-plant, the common clematis. The larva is very sluggish, very rigid and twig-like, and when beaten from its food-plant falls stiff and immobile; it is brown during the winter, but becomes green when the plant puts on its spring foliage. It is full fed about the beginning of June and changes, in a slight web, into a pale greenish pupa. The moth appears in July, and sits by day among clematis, and even when resting on the outside of the bushes is not at all conspicuous, resembling a leaf. Like the larva it is very sluggish by day, and when at length it allows itself to be disturbed it often drops instead of flying. Its time of flight is late in the evening. Distributed through central and southern Europe, except the Iberian peninsula, through Asia Minor, Transcaucasia, etc., and in the form *lissas* as far as the Thian Shan district. I have not seen examples from the Kentei Mountains, where it is said also to occur. In Amurland and the Ussuri district nearly typical *chrysoprasaria* reappears, the specimens often large and with the lines rather widely separated.

H. zimmermanni *Hed.* (3 a) is very similar to *chrysoprasaria*, but with the elbow at end of third radial of hindwing enlarged into a more definite tooth, the lines dentate, that of hindwing making a distad bend at inner margin, and with longer pectinations and palpus, at least in the ♀. Inhabits Amurland and Ussuri at the end of June and in July. STAUDINGER states that he has received from the former territory examples with the lines so weakly dentate that he suspects they may be hybrids between the present species and *chrysoprasaria*, or even that we are dealing with a mere aberration. The latter supposition is precluded by the palpal and antennal differences.

H. dijuncta *Walk.* Of this species I have only seen faded specimens. It seems to be very closely allied to *veneta*, perhaps of a rather lighter, bluer green, the hindwing more rounded apically, with slightly sharper tail and with the postmedian line placed more proximally. It cannot be a mere form of that species however, for the palpus is short. Hindwing with first median separate (in *veneta* stalked, or at least connate). Shanghai, Yokohama, Nikko, etc. May, June and August. It is not impossible this may be the species which STAUDINGER records from Japan as „var. ? an sp. div. ?“ to *chrysoprasaria*.

H. veneta *Btlr.* (2 h). Palpus of moderate length, third joint in ♀ rather long. Colour bright green, the white lines slender, placed somewhat as in *chrysoprasaria*, the antemedian of forewing less strongly curved, postmedian usually well removed from it, the line on the hindwing forming a continuation to this line, not placed further distally as in *chrysoprasaria*. Angle of hindwing slightly stronger, more as in *zimmermanni*. But differs above all in having a very fine olive brown marginal line and whitish fringes spotted with red brown. Under surface paler, the lines almost or altogether obsolete. Japan: Tokio, Oiwake, etc., in July, August and September. Also from Gensan, Korea. Varies considerably in size, but scarcely otherwise.

H. insolitaria *Leech* (2 h) only known to me in a single example, and that not in quite perfect condition, is exceedingly like *veneta*, and may prove to be an aberration of it. The angle in the hindwing seems somewhat stronger, the colour of both wings slightly fuller and darker, the antemedian line weak (rather too distinct in our figure), postmedian not even faintly denticulate, spots on the fringe perhaps brighter red. Satsuma, Japan, captured in May. Type (♂) in coll. Brit. Mus. The specimen from Chang Yang which LEECH referred to this species as its ♀, is a *Hemithea* allied to *unilinearia*.

H. parallelaria *Leech* (2 h) bears a remarkable superficial resemblance to *Hipparchus vallata*, the distal margin of the forewing being straighter and the tail of the hindwing stronger than in the preceding species, while the red-brown spots in the fringe are restricted to a large one at this tail and a small one at the end of the first median of hindwing almost exactly as in *vallata*. The structure, however, is that of *Hemistola* and the underside, as is usual in this genus, is simply a paler, weaker reproduction of the upper, not white-banded as in *vallata*. Western China: Mou-pin and Ni-tou.

H. nemoriata *Stgr.*, which is quite unknown to me, may possibly (according to the characters given) belong to this genus. It was founded on a single worn ♂ from south-eastern Siberia, and is described as verdigris green with a fine, weakly dentate white postmedian line and a dark marginal line, forewing in addition with a faint, almost invisible antemedian line. Shape somewhat as in *Nemoria*, antennal pectinations as long as in *smaragdaria*, palpus even thinner and shorter than in *Thalera*, hindtibia with two pairs of spurs.

H. detracta *Walk.* (= *unduligera* *Btlr.* = *vestigiata* *Swinh.* = *annuligera* *Warr.*) (2 h) is not unlike *chrysoprasaria* in shape, the elbow in hindwing generally weak, sometimes wanting (as in *lissas*); very different in its much smaller size, duller blue-green colour, strongly dentate lines and the presence in the centre of each wing of a large white ring. Costal edge ochreous. Underside paler, unmarked. Widely distributed in north-west India, including Kulu and Kashmir. Our figure of the ♂ is copied from BUTLER's very bad figure; the ♀ is from nature.

H. dispartita *Walk.* (2 h) differs from all the preceding *Hemistola*-species in having non-pectinate antenna, and forms, together with a few North Indian species, a separate section of the genus. Colour near that of *chrysoprasaria*, slightly more yellowish green, postmedian line denticulate, on hindwing out-bent in the middle; both wings with a rather large white cell-spot. North-west India, including Kashmir, where it occurs towards the end of June.

Note. — The species from Korea described and figured by ALPHÉRAKY as *Thalera tenuilinea* is also likely to be a *Hemistola*, unless it form a new genus. It is unfortunately entirely unknown to me, and its author gives practically no information about the structure, but it would be somewhat aberrant in possessing „four small white crests on the abdomen“ — although there is just a suspicion of creasing in *rubrimargo* and perhaps one or two other species of the genus. In size and shape and in the bright colouring *tenuilinea* would seem to

come near *veneta* or *insolitaria*, and it shares with them the presence of brown spots (though weak) on the pale fringes. But the lines are markedly dentate and each wing bears a white discal ring, somewhat as in *detracta*. The costal edge of the forewing is ochreous, the lines are yellow-whitish, the underside much paler than the upper, almost unmarked.

33. Genus: **Iodis** Hbn.

Palpus moderate or rather long, third joint in both sexes distinct, smooth, in ♀ elongate. Antenna in ♂ bipectinate. Hindtibia in ♂ with hair-pencil, in both sexes with all spurs. Forewing with first subcostal stalked, usually anastomosing with costal and occasionally with second subcostal, first median usually connate or short-stalked. Hindwing rather long, with distal margin nearly always bent or angled at third radial, second subcostal stalked, first median usually stalked. Scaling smooth, often more or less iridescent. Larva long and slender, head deeply bifid, flattened anteriorly, prothorax with the usual points anteriorly, skin-surface rugose, anal flap produced prominently behind. Pupa very slender, tapering, wing-cases rather long, distinctly veined, cremaster long, slender, tapering, bearing some hooked bristles. The species are nearly all of small size. They belong chiefly to India, but a few species have reached Europe, Japan, Formosa, etc.

lactearia.

1. **I. lactearia** L. (= *vernaria* L. = *aeruginaria* Hbn.) (2 h). When freshly emerged from the pupa the ground-colour is of a beautiful delicate light green, but this colour is extraordinarily fugitive, and most specimens which are met with, as well as all which have stood in a collection a few years, are almost or quite white. The white postmedian line is on both wings almost entirely parallel to the distal margin, and not dentate. The larva feeds on oak, birch and various other trees, and even lower growths, in August and September. The pupa hibernates in a very slight cocoon among dead leaves, and the moth appears in June. It frequents chiefly wooded country, and flies in the clearings or on the borders of the woods rather early in the evening, its whitish colouring rendering it very conspicuous. When disturbed from its hiding-places by day its flight is weak and vacillating, and never very long-sustained. Widely distributed in Europe and Palearctic Asia, reaching to Japan. — **norbertaria** Rössl. said to form a local race at Bilbao, is more thickly scaled and more deeply coloured.

norbertaria.

putata.

1. **I. putata** L. (= *putatoria* L. = *micantaria* Esp. = *alliata* Höfn.) (2 h). Similar to *lactearia* but with the postmedian line dentate, and not parallel with distal margin. Moreover the forewing is slightly less elongate. Foodplants, times of appearance and habits are nearly the same as in *lactearia*, but *putata* is a more local species, being chiefly confined to central and northern Europe (excluding Britain), Armenia and Japan. Has been recorded also for Korea and Amurland. According to LEECH the Japanese specimens are rather darker than the European. Unfortunately I have not access to any fresh specimens, and it is impossible to found a local race on those which may have become discoloured through accident.

praerupta.

1. **I. praerupta** Btlr. (= *steroparia* Püng.) (2 i) is similar to *putata*, but of a somewhat fuller, less evanescent green colour, the teeth in the white lines stronger, the postmedian of forewing broad at inner margin, the discal marks consisting of white rings. ♂ antennal pectinations perhaps somewhat shorter than in *putata*, palpus in both sexes shorter. Japan and Amurland.

dentifascia.

1. **I. dentifascia** Warr. (2 i) is also similar to *putata*, but much larger and darker, being of a dull bluish green. It usually shows traces of a large darker cell-spot, at least on the hindwing. Japan and Korea. Flies in June and July.

sinuosaria.

1. **I. sinuosaria** Leech (2 i). Pale green, the dentate postmedian expanding in the middle of forewing and near the inner margin of both wings, the antemedian followed and the postmedian preceded by a darker green shade or line. Discal spots white, dark-margined. Under surface whitish, the forewing tinged with green. Probably a form of the Indian species *argutaria*, but distinguishable by the mentioned expansions of the postmedian, the large white spot between the second median and second submedian veins of forewing especially conspicuous. Japan and W. China.

34. Genus: **Comostola** Meyr.

Differs from *Iodis* more in shape and facies than in structure, the distal margin of the hindwing being only very slightly bent at the end of the third radial, or strongly rounded, and the colour being bright green, not translucent, usually with some red markings. The neurulation is, however, characteristic in one respect, the second discocellular of both wings curving outwards more or less strongly, so that the third arises further, sometimes even much further from the base of the wing, the anterior half of the cell being therefore materially shorter than the posterior. The costal vein of the hindwing is formed almost as in the *Acidaliinae*, touching or anastomosing with the subcostal at a point only and then very strongly diverging, whereas in *Iodis* it seldom touches the subcostal, but usually remains approximated for a longer period, though still not far. The genus is chiefly Indo-Australian, but a few species reach the outskirts of the Palearctic Region.

C. subtiliaria *Brem.* (2 i) belongs to a group of very similar species or forms which includes the name-*subtiliaria*. type of the genus and will probably require careful anatomical investigation before the specific right or otherwise of its various constituents can be satisfactorily determined. The degree of irregularity in the form of the discocellulars, as described above, sometimes affords useful clues, but cannot always be relied upon. I have not seen specimens from Amurland and the Ussuri, from which BREMER described his species, but according to his figure, and a communication from PÜNGELER, it is the same blue-green form which reaches to Wa-ssu-kow and Che-tou in western China, and differs little from the Indian *maculata*. — **nympha** *nympha*. *Btlr.* from Japan is smaller, apple-green, with sharper red marginal markings. In addition to Japan, it occurs at Shanghai. There must be two broods in the year, as it is found in May and June, August and September.

C. ovifera *Warr.* is a less ornamental-looking species than the *subtiliaria*-group, the white spots *ovifera*. being entirely unadorned with red rings or dots and often (except the discal spot) obsolescent, the red marginal line likewise wanting. Underside pale green, a great part of the forewing clouded with grey. The species was first discovered by ELWES in July at Tonglo, Sikkim, at an elevation of 3000 m, but has since been taken at Yatung, Tibet. Perhaps not Palearctic.

C. inops *Prout* (5 a) is similar to the preceding, somewhat intermediate towards *maculata* *Moore* in *inops*. that the postmedian series of white spots is strong on both wings. The colour is yellow-green, that of *ovifera* bluer green. Liddon Valley, Kashmir.

35. Genus: **Pyrrhorachis** *Warr.*

A small Indo-Australian genus which will be discussed elsewhere, differing from *Comostola* in the simple discocellulars, from *Iodis* in the strongly rounded hindwing. It is only introduced here because a single Japanese species, of which only two specimens are known, seems to fit into it better than into any other known genus. But it is not typical and its location here is probably only temporary.

P. rubripunctata *Warr.* Pale yellowish green, each wing with a red cell-spot. Otherwise unmar-*rubri-*ked. Underside paler, unmarked. Face and palpus brownish red. Kagoshima, Japan, collected by JONAS *punctata*. in July, 1900 and by WILEMAN in July, 1898.

36. Genus: **Eucrostes** *Hbn.*

Palpus moderate, with third joint in ♂ minute, in ♀ moderate to long. Antenna short, in ♂ with long, in ♀ with short pectinations. Hindtibia in both sexes with a single pair of spurs. Wings ample (except in *simonyi*, which should probably form a separate genus), distal margin and fringe usually red. Forewing with first subcostal arising from cell, running into costal, or at the least anastomosing strongly, first median usually stalked. Hindwing usually long, distal margin strongly rounded, neuration as in *Comostola*. Differs essentially from the two preceding genera in the absence of the proximal pair of spurs of the hindtibia. The larva is of medium proportions, the head relatively small and — unlike those of most of the subfamily — not bifid, somewhat flattened in front, prothorax higher, dorsally with four points, segment-incisions deep, the first to fifth and the eighth abdominal each with a dorsal point, spiracles small. Pupa rather obtuse, smooth, resting in a slight cocoon among the foodplant. Hibernates as larva. A very beautiful and, with the exception of one or two species, a very natural genus. Its home is in Africa, but one or two species occur in each of the other continents.

E. indigenata *Vill.* (= *fimbriolaria* *Hbn.*) (2 i) is the name-type of the genus, and thoroughly repre-*indigenata*. sentative of its normal coloration and marking. The bright green ground-colour shows only the faintest trace of pale postmedian line, the red cell-spots are of moderate size, the red margin is preceded by a slight yellow shade, and broadens close to the anal angle of both wings. Underside similar, somewhat paler, costal margin reddish. — **nudilimbaria** *Mab.*, from Corsica, lacks the yellow line before the red margin, and some-*nudilim-*times has the discal spots indistinct. I have seen an aberration from Gibraltar which seems referable to it, *baria*. and a transitional form is said to occur also in Dalmatia. — The larva is bright green, tinged with red anteriorly and posteriorly, segment-incisions yellowish, dorsal points reddish. It lives on species of *Euphorbia*, particularly *E. spinosa*, and is very sluggish. There are two, often even three broods in the year. According to MILLÈRE the nutriment is obtained in large measure by sucking the juices of the plant. The pupa is of nearly the same green as the larva. The moth flies in southern Europe, N. Africa, Asia Minor and Syria.

simonyi.

E. simonyi *Rbl.* (= *divincta* *Holt-White* = *pallida* *Warr.*) (3 c) has the wings long and narrow, recalling the genus *Rhadinomphax* of South Africa. The forewing is pale green, without markings; the fringe and the entire hindwing greenish white. Under surface similar. Besides the great difference in shape and coloration, this species differs from true *Eucrostes* in the ♀ antenna, which is merely serrate-dentate, not pectinate. Canaries. Mrs. HOLT-WHITE records the capture of a ♂ on Teneriffe in April, flying at dusk among cactus plants at about 150 m. The only two specimens which I have before me are a ♂ and a ♀ likewise from Teneriffe, the former bred by Lord WALSINGHAM from an undescribed larva found on *Frankenia ericifolia* on 16 March, the moth emerging on 15 April.

37. Genus: **Xenochlorodes** *Warr.*

Palpus minute. Antenna in ♂ pectinate, in ♀ serrate (in *nubigena* simple). Hindtibia with a single pair of spurs. First subcostal stalked or connate with the other subcostals, running into costal or at least anastomosing, first median stalked, rarely only connate. Hindwing with costal anastomosing with subcostal for the greater part of the length of cell, second subcostal and first median both stalked, second radial from scarcely above middle of discocellulars. Differs essentially from *Eucrostes* in the strong anastomosis of the costal vein of the hindwing. Consists of only three species, all Palearctic.

nubigena.

X. nubigena *Woll.* (3 c) differs from the other species in facies, and in some slight details of structure, but is certainly congeneric. Delicate green, with the costal edge narrowly crimson (broadly in basal half beneath), both wings with a curved white postmedian line, usually thick, subdentate, sometimes broken up into spots, a little recalling *Comostola ovifera* or *inops*. Occurs only in Madeira, in May and June, frequenting the heath-woods of the loftiest elevations, and is strongly attracted by light.

olympiaria.

X. olympiaria *H.-Sch.* Pale delicate green with an indistinct pale postmedian line and occasionally traces of an antemedian. Costal edge yellowish white. Distal part of fringe white. Face reddish. Neighborhood of Brusa and some parts of Syria. — **cremonaria** *Stgr.* (= *pallida* *Warr.*) is much paler, often nearly white, although showing, when quite fresh, a delicate greenish shade. In such condition the lines are still traceable, but faded specimens appear entirely unicolorous. Syria: about Beyrout and probably elsewhere.

beryllaria.

X. beryllaria *Mann* (= *aureliaria* *Mill.*) (2 e, ♂; 2 i, ♀). Nearly related to the preceding and of closely similar structure, but at once distinguishable by its beautiful bright emerald-green colour. It is also on an average larger, and has the first subcostal of forewing longer-stalked. Postmedian line removed further from the distal margin, sometimes forming more distinct spots on the veins. Distributed locally in southern Europe, North Africa, Syria and the Taurus Mountains.

4. Subfamily: **Acidaliinae.**

Mostly small, slenderly-built moths, commonly of white, light brownish, ochreous or similar coloration, the markings consisting principally of darker transverse lines. Face nearly always smooth-scaled, usually flat. Palpus usually short (long in some of the *Anisodes*-group). Antenna in the ♂ not infrequently bipectinate, but by no means so generally as in the *Hemitheinae*; in the ♀ nearly always simple. Hindleg very variable; in the ♂ often aborted and without spurs; the number of spurs, if present, varying in the ♂ from 1 to 4, in the ♀ from 2 to 4, ♀ often with more spurs than ♂. Abdomen not crested, rather slenderly attached to thorax. Forewing usually smooth-margined, all the veins almost invariably present, subcostals usually anastomosing so as to form one or two accessory cells (often called "areoles"), the second subcostal invariably anastomosing with or arising out of the third. Frenulum well developed. Hindwing varied in shape and structure, sometimes more or less contorted in the ♂, costal vein anastomosing with subcostal at a point near base, then usually diverging rapidly, second radial usually arising from the middle of the discocellulars.

The eggs are of approximately the ordinary Geometrid form, the length greater than the breadth, the breadth than the height, and usually with one end broader and higher than the other. Some are more regularly ovate, others more nearly cylindrical, others again so much flattened that they have been described as "discs". They are usually attached by one side, but not infrequently a little tilted, in *Acidalia* even often attached by the end opposite the micropyle, becoming in position "upright eggs", though still maintaining the shape and proportions of the "flat egg" of CHAPMAN. A very frequent colour-scheme — apparently almost invariable in the typical genus — consists in the presence of irregular spots or blotches of some shade of red. The great majority of the known larvae, excepting those of *Cosymbia* and a few of its allies, feed on low plants, and hibernate in the larval stage. They are comparatively seldom found free, and our knowledge of very many

species has been gained solely by obtaining eggs in captivity. The ♀♀ deposit their eggs very readily, and many of the species are quite easy to rear, the commonest weeds, such as knotgrass and dandelion, being willingly accepted by most of them. They show a marked predilection for withering leaves, and some, indeed, thrive well on food which is actually mouldy. In some cases there are two or more broods during the summer, but many of the larvae grow very slowly, and produce only a single brood of imagines. The pupa is rarely, if ever, truly subterranean, although many species, if provided with earth, will use it in the constructions of their slight cocoons. The usual habit, however, is to spin up loosely among dead leaves or other refuse on the surface of the ground. The remarkably different habit of the *Cosymbia*-group has been mentioned in our Introduction. The colour is usually light brown, scarcely ever that reddish brown which is general among the subterranean pupae. The surface is usually pretty smooth and almost, or altogether, without markings, but some species of *Ptychopoda* are somewhat rougher, with the dorsal surface spotted and the wing-veins strongly marked. The duration of the pupal stage, except in hibernating *Cosymbia*, is generally short. The method of dehiscence is characteristic, the anterior part of the pupa-case being much broken and the entire thorax strongly cleft dorsally, the edges at the point of cleavage bending markedly inwards.

The moths as a rule fly gently at dusk or later and are usually found in large numbers where they occur, although many are excessively local; several species will occasionally visit flowers or the sugar spread for Noctuids, or may be attracted by a strong light. During the day they rest among bushes or herbage, a few species, such as *Acidalia marginepunctata*, *Ptychopoda eburnata* etc., on rocks or stone wells. The majority can easily be disturbed, and do not fly fast or far, so that their capture presents no difficulty. Sometimes in their resting-places they are not even concealed; thus *Acidalia floslactata* and *Ptychopoda rusticata* often sit on the upper side of leaves, the latter species (and perhaps also the former) being sufficiently protected by a resemblance to the excrement of birds.

The *Acidaliinae* may be divided into 3 principal groups, one of which, the *Cyllopoda*-group, belongs to the Central and South American Region. The other two groups are of almost world-wide occurrence, although very weakly represented in the Arctic regions and wanting in New Zealand and Hawaii, with the exception of a single (probably introduced) species in the former country. The typical or *Acidalia*-group has the pupa normal, the imago with the first subcostal vein occasionally free, but if stalked or anastomosing with the other subcostals, then separating early — usually well before the fifth subcostal, the areole usually large, not infrequently double, the palpus rarely long, the ♂ antenna mostly ciliate, the ♂ hindleg very commonly aborted, the ♂ genitalia with the valve simple in form, only a long unarmed flap or a simple valve ending in a curved head. The *Cosymbia*-group has the pupa attached to a leaf by its tail and a silken girth, resembling that of many butterflies, the imago with the first subcostal vein stalked to (usually) well beyond the fifth the areole usually very small or wanting, never double, the palpus often long, the ♂ antenna strongly bipectinate, the ♂ hindleg usually not aborted, the ♂ genitalia with the valve of a much more complex structure than in the *Acidalia*-group. The larvae will also probably present reliable distinctions; at present we merely call attention to the less cylindrical form and strong rugosity of many of the larvae of the *Acidalia* group and their attachment to low plants and larval hibernation, while those of the *Cosymbia*-group affect trees and hibernate as pupae. The presence of rounded white discal spots on one or both wings is also generally indicative of a species of the *Cosymbia*-group, but cannot be always relied upon.

Neither the *Acidalia*- nor the *Cosymbia*-group can be regarded as arising at all directly from the other; each is the more specialized in certain respects, and they must have sprung collaterally from the primitive Acidaliid stirps. It is also noteworthy that the genera with double areole (which, according to the usual conception of phylogeny, should be older than those with single areole or with all the subcostals stalked) furnish scarcely any examples of unmodified hindleg structure; most of the genera in which both sexes retain all the spurs are found among the groups with single areole or even (*Chrysocraspeda*) without areole.

On account of the large number and general similarity of the species I have given somewhat fuller descriptions, differentiations and synonymy here than in the other subfamilies.

The *Acidalia*-group.

Areole double (*)

Areole single (**)

Genera 1—6.

Genera 7—23.

1. Genus: **Rhodostrophia** Hbn.

Palpus rather short or moderate. Antenna in ♂ moderately long, bipectinate, with slender branches, two pairs on each segment. Hindtibia in ♂ slender, with or without hair-pencil, with a pair of terminal

*) The outer areole open at its distal end in *Apostates*.

**) Occasionally open at its distal extremity, the first subcostal merely approaching instead of anastomosing with the others; see *Ptychopoda* and *Cleta*.

spurs and a single median spur or a pair; in ♀ with all spurs. Hindtarsus not abbreviated. Forewing with areole double, the second subcostal vein arising either from the cell or from the stalk of the 3.—5. subcostals. Hindwing with the second subcostal stalked with the first median.

Very few of the larvae are known. They are extremely long and slender, tapering a little anteriorly, the face and sides of the head flattened; they feed on low plants and hibernate. Pupa also slender, broadening markedly anteriorly; two strong spines at anal extremity, small knobs at their base, two pairs of hooks before them.

The genus, with the exception of one or two species, has a distinctive aspect and, notwithstanding the structural variation in one or two details noted above, is in general easy to recognize. MEYRICK considers that "it must certainly closely approach the primitive type" of the subfamily. Its geographical distribution is peculiar, as it appears to be confined to the Palearctic Region, North India and Chili. Its head-quarters are undoubtedly in Central Asia, and the boundaries of the Palearctic and Indo-Australian Regions furnish many species, but we regard it as belonging essentially to the former.

The commonest and at the same time most distinctive type of coloration is that seen in the best-known European species — a yellowish ground-colour with bright rose-coloured lines or bands. Variation consists chiefly in the degree of development of the bands, both as regards depth of colour and extent, and many species produce occasionally a unicolorous form, the ground-colour being evenly dusted over throughout.

For convenience of determination the genus can be subdivided according to the hindtibial armature of the ♂ and the point of origin of the second subcostal vein of the forewing; but it seems quite certain that neither of these characters (so often of value generically) is in the present genus of high taxonomic importance. Thus the spurring would place *quadricalcarata* in a different section from its Sicilian representative *sicanaria*, while the venation, though constant in most species, sometimes varies in *philolaches* and *vinacearia*, and occasional variability may be expected in some other species. The species with 4-spurred ♂, which must be considered the more ancestral, all inhabit the southern Palearctic Region.

A. Section *Rhodostrophia*. Second subcostal of forewing arising from cell.

badiaria-group.

♂ hindtibia with 4 spurs. Distal margin of hindwing usually pretty straight from anal angle to first radial. The markings rarely rose-coloured.

R. jacularia is a conspicuous species, easily recognized by the strongly darkened markings on a light ground-colour, the outer band of the forewing strongly sinuous, followed by a white line. The hindwing above is paler than the forewing. Under surface of both wings pale, almost entirely unmarked. — The type-form, *jacularia* Hbn. (3 e) with yellow-brown ground-colour and with a distinct line on the hindwing, ranges from South-East Russia to the Changai Mountains in Western Mongolia. — The ab. *carnosaria* Stgr. is, according to its author, a form with the forewing and distal border of hindwing more reddish, the line on the hindwing obsolete. It is reported from the Eastern Thian-Shan and the Changai Mountains, possibly forming a local race in the former district. — *minor* Alph. is a very small form from the Ordos district, Mongolia (about 25 mm expanse) with almost unmarked hindwing.

R. vastaria Chr. is in some respects intermediate between *jacularia* and *badiaria*, the absence of a middle line and the frequent presence of rather strong dark shading proximally to the outer somewhat recalling the former species, while the less bright, more dark-dusted ground-colour, with the hindwing not or scarcely whiter than the forewing, the less oblique inner line and some other characters seem to place it nearer to *badiaria*. The inner line is at least as far from the base on the posterior margin as on the costa, is more or less interrupted by the veins and thickened distally between them. The outer is sinuate and somewhat dentate, and projects rather strongly near its posterior end, thus reaching the margin very near the posterior angle. The under surface is almost unmarked. The ♀ is paler than the ♂. Described from Krasnovodsk, Transcaspia, where it flies on the sandy steppes in May; also occurs in the Thian-shan district.

R. badiaria Frr. (= *emucidaria* Ev. = *telaria* H.-Sch. = *praecanaria* Ev.) (3 d, as *praecisaria*). Light brownish grey, finely dusted with darker scales, again more weakly marked than the preceding species, but with a median line present on both wings, placed about half-way between the discal spot and the outer line, the latter not accompanied proximally by a dark band. Hindwing slightly paler. Under surface almost without markings. Distributed throughout Asiatic Turkey, extending in one direction into Southern Russia and in another into Persia. The example which served as model for our figure came from Armenia. The names of this species and *praecisaria* are unfortunately transposed on the plate. Of the habits of this species we have at present but little knowledge, but it is said to frequent dry fields and hills in the months of May and June.

R. terrestraria Led. (3 d) is of similar colour to the preceding (only somewhat browner in tone) but *terrestraria*. very differently marked. Forewing with an indistinct, rather oblique, slightly curved inner line, a small, not very strongly expressed discal spot, a nearly straight dark outer line parallel with the distal margin, and a very faint pale straight line or shade midway between this line and the margin. Hindwing paler, only a not very broad distal border nearly concolorous with the forewing; lines and discal spot wanting. Under surface pale, without markings. Only recorded from Persia. — **pellonaria** Chr., which represents *terrestraria* in Transcaspia, *pellonaria*. differs chiefly in the rather brighter colouring, but weaker markings, and in having the hindwing yellowish or ochraceous. CHRISTOPH figures *pellonaria* with both wings coloured almost as in the *calabra* group, but the specimens before me suggest that this is exaggerated. Flies in weedy places where there are patches of bush; June, the ♀ appearing when the ♂ is getting worn.

R. dispar Stgr. (3 d, ♂) exhibits more pronounced sexual dimorphism than most of the genus. The ♂ *dispar*. somewhat recalls *terrestraria pellonaria*, or still more the unicolorous forms in the *calabra* group; bands wanting, discal spots present above and beneath; underside mostly yellow, forewing with a slight smoky suffusion costally and again between the median and submedian folds from the base to about two-thirds of the wing. The ♀, besides having the wings (especially the hindwing) rather narrower, differs in being somewhat paler and having two nearly straight dark transverse lines, the proximal placed about as in *badiaria*, the distal parallel with and rather near the margin, only at its anterior extremity a little curved proximad; this latter line is sometimes preceded by a band-like dark shade. Only known from Samarkand and one or two other places in Western Turkestan. Flies in May. STAUDINGER mentions one abnormality in which one of the middle spurs is shortened on one leg and wanting on the other, thus bringing it near to the species of the following group.

calabra-group.

♂ hindtibia with 3 spurs (except in certain forms of *sicanaria*). Distal margin of hindwing usually rounded. The markings very frequently rose-coloured.

R. calabra is a very beautiful species, and very interesting on account of the branches into which it has split up and which have given so much trouble to systematists. Those which differ the most definitely in structure are here considered distinct species, although they show extraordinarily little deviation except in a single character, the hindleg of the ♂. ZELLER considered that *tabidaria*, as well as *sicanaria*, differed sufficiently from *calabra* to be regarded as a species, and it is quite possible he will be proved correct; but inasmuch as I have found (in common with LEDERER, FUCHS and STAUDINGER) that there is some degree of variation in the length of the hair-pencil and of the median spur, and our measurements do not altogether agree with ZELLER's, I feel compelled at present to treat *tabidaria* as only a local race, while *sicanaria* on the contrary (together with its subspecies *quadricalcarata*) can with confidence be called an independent species. *calabra* and its immediate allies are easily recognizable by the rosy postmedian band and rosy distal margin of both wings, on a rather bright yellowish (sometimes more olive-tinted) ground-colour. The other European species, *vibicaria*, has the ground-colour much less yellow and has nearly always three distinct pink transverse lines, which remain traceable even when the space between the second and third is more or less filled up into a band. The true *calabra* can further be readily distinguished by the peculiar long, thick, club-shaped median spur of the ♂ hindtibia, which is placed rather near the terminal spurs; hindtibia also with a long hair-pencil. The species is distributed and often common in Southern Europe and Asiatic Turkey, and extends into some localities in Southern Central Europe, but apparently only in the warmer valleys; it occurs from May to July, in Andalusia already in April. The flight, as with most Acidaliids, is not long-sustained, the moth soon dropping to the ground and concealing itself in the grass or under thick bushes. The life-history has been described by FUCHS and others. The eggs are firmly attached, are elongate, with lateral depressions, in colour bluish at first, changing to reddish. The larva feeds on *Sarothamnus scoparius* and probably other allied species. It hibernates when it has reached a length of about 18—20 mm. The full-fed larva is yellow-brown or grey, dorsally darkened on the middle segments, the dark area containing some light spots; tubercles whitish, setae short, black. It spins a rather large cocoon in moss or on the surface of the earth, changing into a long, slender pupa of about 14 mm length and of a light yellow-brown colour, with dark dorsal line and honey-yellow wing-cases. — **calabra** Pet. *calabra*. (= *trifasciata* Cyr.) (2 k) is the oldest name for the ordinary form, and must be accepted, as was long ago done by LEDERER. ZELLER, STAUDINGER and others have called it by the Hübnerian name of *calabrararia*, which, however, is merely PETAGNA's name with an altered ending, so that the two would stand or fall together. As the original specimen was figured from Calabria, ZELLER thought it was possible that it really belonged to the allied *sicanaria*, but the hindwing as figured is that of a typical *calabrararia* Zell., so that we see no reason whatever for disturbing the synonymy. The form has the yellow ground-colour of both fore- and hindwing usually tinged with olive, the rosy bands usually sharply expressed, the inner band (or line) rarely accompanied by rosy suffusion basewards; discal spots wanting, or a very small one present on forewing only. Southern

taeniaria. and Southern Central Europe and Syria; ? Armenia. — ab. *taeniaria* *Frr.*, originally described from a ♀ from Ragusa (? Dalmatia), is a pale yellow form with the markings grey instead of rosy. If it came from Ragusa in Sicily, the name will have to be transferred to *sicanaria*; the specimen was furnished by a Laibach entomologist. — ab. *separata* *Th.-Mieg* is a not very important aberration, of rather frequent occurrence (at least in France and Spain), in which the postmedian band is broken up into two lines, the interspace remaining of the ground-colour. — ab. *unilinea* *ab. nov.*, is a further and much rarer development in which the outer line of ab. *separata* is obsolete, only a few rosy scales being discernible beyond the middle line; antemedian line of forewing also faint, distal margins and fringes scarcely rosy. Casayo and Canales, Spain, in coll. L. B. PROUT. — In ab. *sanguinea* *Th.-Mieg*, on the other hand, the rosy colouring suffuses the whole of the wings, sometimes so completely as almost entirely to obliterate the markings. Eastern Pyrenees, with the type-form. *muscosa*. — *muscosa* *Bastelb.*, founded on 3 ♂ and 1 ♀ from Kreuznach, and considered by its author to be a distinct local race, is apparently similar to ab. *taeniaria* *Frr.*, but is described as yellowish grey tinged with moss-green, the markings and fringes dirty moss-green, the outer band rather narrower than usual, a small discal spot present on forewing. Some Andalusian specimens before me approach this form, but are less extreme and incline, in the formation of the outer band, to ab. *separata*. It may be here remarked that the Spanish forms are very often somewhat duller, and with larger discal spot, than those from more easterly localities, but they vary greatly, without producing any local race; I even have one specimen from Bejar, and STAUDINGER, RIBBE and CHRISTOPH record others from Northern and Southern Spain and Transcaucasia respectively, which, in the presence of a conspicuous discal spot on the hindwing, would be referable to the next-mentioned form. — *tabidaria*. *tabidaria* *Zell.* (2 k). We have already stated that this form may possibly be entitled to specific rank. If so, the aberration occurring among the type form in Spain and in Transcaucasia will no doubt prove to owe its likeness to *tabidaria* merely to convergence. The true *tabidaria*, in addition to having a large discal spot present on each wing, has the band usually a little broader than in *calabra calabra*, its edges often more denticulate, and the basal area of the forewing more suffused with rosy. Perhaps the distal area of both wings is also on the average more broadly suffused, but both forms are variable in this respect. According to ZELLER the hair-pencil in *tabidaria* is a little shorter than in the name-type, as is also the median spur. I have only in part verified these observations, while GUENEE's statement that the ♀ lacks one of the median spurs is certainly erroneous. The form occurs in Southern Hungary, the Balkan Peninsula, Asia Minor, Cyprus and Syria. The only specimens which I have seen from Crete seem to indicate a subordinate race, rather smaller, the band even broader and separated into two distinct lines, as in *calabra* ab. *separata*; they bear a curious resemblance to *inconspicua* *Butl.*, though much larger. As, however, they are not in quite perfect condition, and I have not the ♂, I forbear to name the form.

R. sicanaria is confusingly similar to the lighter forms of the preceding species, without discal spots, but can be easily separated by the hindtibia of the ♂. This is slender, without hair-pencil, the median spur not club-shaped and not abnormally approximated to the terminal spurs, the second median spur also sometimes present. In general the yellow ground-colour is less olivaceous than in *calabra*, the hindwing in particular of a clearer or brighter yellow, the transverse band of this wing seldom, if ever, complete, usually only conspicuous in (approximately) the inner-marginal half. — *sicanaria* *Zell.* (2 k). The form originally described by ZELLER, with only three spurs on the hindtibia, occurs in Sicily, and has the forewing, as a rule, as strongly and brightly marked as that of *calabra*. I have, however, seen one ♂ from Syracuse resembling the form *quadricalcarata* in colour, while STAUDINGER records one sport with a fourth spur present on the left hindtibia and GUENEE's sole Palermo ♂ had also both the median spurs — whether on both hindlegs is not stated. Thus the races of this species have apparently not yet become quite sharply differentiated, though tending in that direction and probably even towards species-formation. I have unfortunately not seen the North African form which STAUDINGER refers here, but HEIR PÜNGELER writes me that his 3 Algerian ♂♂ have both median spurs, thus referable to *quadricalcarata*. — *perezaria* *Ob.* was founded on a single aberrant ♀ from Carthage and has been determined by STAUDINGER as an aberration of *sicanaria*. As we have no proof that he is incorrect, I am placing it here provisionally; but the locality raises a suspicion that it should rather belong to *quadricalcarata*, or else to *calabra*. The forewing is uniformly dusted with rosy above, obliterating the markings, as in extreme forms of *calabra* ab. *sanguinea*; the hindwing above is yellow, without the band, the anal area broadly dusted. Beneath the conditions are nearly reversed, the forewing being yellow, only dusted at the costal and distal margins and in the apical area, the hindwing dusted all over except a narrow inner-marginal area. The size is rather small for *calabra*, and this circumstance, together with the unmarked yellow hindwing above and forewing beneath, brings it rather near one or two of the examples of undoubted *quadricalcarata*. — *quadricalcarata* *subsp. nov.* (5 c). Scarcely distinguishable from certain aberrations of *sicanaria sicanaria* except in the presence of both the median spurs on the hindtibia of the ♂. The rose-coloured markings rather weak, the antemedian line not distinctly defined, accompanied by rosy suffusion reaching to the base, the postmedian band not perceptibly curved, not narrowing at the inner margin of hindwing. Hindwing lighter yellowish than in typical *sicanaria*. Underside of forewing with postmedian line greyish, only markedly rosy from costal margin to first

radial; of hindwing with this band terminating at the second median or only just beyond, whereas in *calabra* and usually in *sicanaria sicanaria* it reaches at least to the first submedian, oftener still further or even to the inner margin. Gibraltar, type (♂) in coll. L. B. PROUT; Algeria, 3 ♂♂ in coll. PÜNGELER; also general in Southern Spain, where it has been recorded as *sicanaria*. Thus Dr. REBEL, in his edition of Berge's „Schmetterlingsbuch“, indicates *sicanaria* as having all the spurs present, although in his diagnosis of the genus he makes one or both of the median spurs always absent in the ♂ — the latter an error. STAUDINGER records one Andalusian sport with only three spurs, and justifies, by the occasional irregularities, the union of the two races.

R. sieversi Chr. (2 k) is superficially very like a large *calabra tabidaria*, to which, indeed, STAUDINGER *sieversi*. at one time by a strange oversight sank it. The structure of the ♂ hindtibia, however, is nearly that of *sicanaria*, only with the median spur slightly more slender still. The wings, too, are of the lighter, clearer yellow of *sicanaria*. Basal area of forewing suffused with rosy, as in the two forms named; outer band placed rather nearer to the distal margin, with its edges more deeply indented, sometimes indeed in part broken into separate segments by the veins remaining of the ground-colour. Under surface of the forewing with the discal spot blackish, not rosy as in the allies; but particularly characterized by a very strong dark smoke-coloured suffusion extending from close to the posterior margin to the median fold or beyond and from the base about to the outer band. This shade, though often faintly suggested, is never nearly so intense in the allied species. Armenia: Erivan and Urdabad; N. W. Persia: Urumiah. Range therefore apparently very restricted.

R. vibicaria is the best-known species of the genus and the most northerly in its geographical range. It differs from *calabra* in its less yellow ground-colour, more sharply-marked rose-coloured lines, with wider space between the median and postmedian, but especially in the shape of the distal margin of the hindwing, which is bent or bluntly angled at the third radial vein, whereas in *calabra* it is almost regularly rounded, but a little straighter from the first to the third radial than anteriorly and posteriorly. The species is very variable in coloration, but only slightly in the position and course of the lines. It was well known to many of the old entomologists and was figured, with its early stages, by RÉAUMUR, ESPER, SCHWARZ and others. The egg is oval, slightly irregular, flattened at both ends and with a strong depression in the middle; about 16 longitudinal ribs, which are transversely grooved; light yellow, changing in 2 or 3 days to bright, light red. The larva is yellowish grey, dorsally brown, occasionally more tinged with ochreous or red, or even with greenish; a light, darker-edged medio-dorsal line; ventral area whitish. The skin is somewhat rugose, the segment-incisions not deep, the subsegments very numerous; tubercles black, bearing single setae. Feeds on *Sarothamnus* and many other plants. The hibernating stage must be variable. DE GRAAF, who gives the best life-history, found it hibernated as a larva. BRAHM definitely says as a pupa, this period lasting about 7 months. RÜHL obtained eggs from the second brood which did not hatch till the following spring. REBEL says the young larvae often hibernate. Pupa yellowish brown. The moth is double-brooded in many parts of its range, but single-brooded northwards (June-July, Central France, Holland, etc.). It hides by day in the grass, but, like most *Geometridae*, can readily be induced to fly. — **vibicaria** Cl. (= *cruentata* Scop. = *artiosa* Geoff.) (2 k) is the form *vibicaria*. in which a rather narrow rosy band follows the middle line, filling in part of the space between this and the outer line. It inhabits most of Europe, the north of Asia Minor, Armenia and Siberia. — ab. **roseata** Ersch. *roseata*. has the rose-coloured shading occupying the basal area of the forewing and extended diffusely from the median line to the distal margin of both wings, thus covering the greater part of the wings. A ♀ in the collection of J. W. LODGESEN is figured by SEPP (Ned. Ins. (2) vol. 4, pl. 36, fig. 18). — In ab. **intermedia** Kempny the *intermedia*. rosy suffusion is more extended than in the type, but less than in ab. *roseata*, the basal area of the forewing remaining of the normal ground-colour. — In ab. **rubrofasciata** Hufn. (= *rubrociliata* Goeze = *fasciata* Rbl.) *rubrofasciata*. only the space between the median and postmedian lines is rosy. — **strigata** Stgr. (2 k, ♂♀) forms a local race *strigata*. in the most southerly localities where the species occurs, as in Lambessa (a large form, not variable, represented by our ♀ figure), Spain (excepting the north), Sicily, Persia and the Ala Tau Mountains; but occasionally appears in other localities as an aberration. It differs in the complete absence of the pink bands, only the lines and discal spot remaining; even the fringe is less brightly rosy than in the type. — **unicolorata** Stgr. is a race, *unicolorata*. or perhaps a closely allied species, in which the lines are also obsolete, both wings being of an almost uniform yellowish, with the fringes tinged with rose-colour. It is recorded from the Altai, S. E. Siberia and the Ala Tau.

R. auctata Stgr. (2 k) rather resembles *vibicaria strigata* in coloration, but differs markedly in shape, *auctata*. as well as in the position and course of the lines, etc. The forewing is rather longer and narrower, the distal margin being more oblique; the hindwing is shaped almost as in the *badiaria* group, with the distal margin nearly straight from the anal angle to towards the first radial. The median line is a little thickened, placed slightly nearer to the postmedian than in *vibicaria*, and makes a faint proximad curve in its posterior half. Both wings become slightly flushed with pink distally, the fringes brighter pink. Discal spot present on both wings, but small. Both wings beneath are slightly more yellowish, the discal spots weak, median and postmedian lines present, the forewing mostly suffused with dark grey from the base to the median line; the fringes pink. Asia Minor to Armenia, local.

adauctata. **R. adauctata** Stgr. (3 d). Related to the preceding, but differing as follows: discal spots very weak or wanting; the space between the median and outer lines usually forming a reddish band; under surface of both wings quite different, that of the forewing pale, scarcely yellowish, and without the dark grey patch, on the other hand usually more or less suffused with reddish, that of the hindwing strongly suffused with reddish. In *auctata* at most the costal and distal borders of the hindwing are reddish. Apparently common in parts of Central Asia (Zerafshan to the Ili district) at the end of June and beginning of July, probably in the mountains.

praecisaria. **R. praecisaria** Stgr. (3 d, as *badiaria*) is extremely similar to *badiaria* except in shape, and in the absence of one of the median spurs in the ♂. The forewing is produced to a more acute apex, the hindwing has the distal margin rounded. Usually also the ground-colour, both above and beneath, is somewhat more reddish than in *badiaria*, but both species vary in this respect. The markings are usually a little stronger, and the central line rather straighter. This species was treated as a form of *badiaria* by CHRISTOPH (Rom. Mém. sur Lép. vol. 2, p. 126) and by STAUDINGER. It inhabits Central Asia (Transcaspia to Issyk-Kul).

meonaria. **R. meonaria** Guen. (= *pellonaria* Hmps.) (7 a). The species which, according to GUENÉE's description, I identify as *meonaria*, has nearly the coloration of *adauctata* (the ground-colour slightly paler above, in dark specimens more olivaceous, rather redder beneath) but is smaller, the wings are still narrower, the forewing almost subfalcate, the distal margin being in general faintly concave, and further differs in having the median line removed nearer to the distal margin (close, indeed, to the outer line, which, however, is usually very weak or wanting), its course slightly oblique and as a rule very gently incurved, nearly straight. On the forewing this median line is often of a very bright deep red colour, on the hindwing it is often indistinct, especially towards the costa. The forewing lacks the inner line and the discal spot is extremely indistinct or more generally wanting, on the hindwing always wanting. Costal edge of forewing and fringe of both wings more or less tinged with red. This species belongs chiefly to N. W. India and perhaps scarcely enters the Palearctic Region. I have specimens before me from Kashmir, from Western China (Pu-tsu-fong, Chow-pin-sa), etc. I have noticed one aberration in which the 2. subcostal is stalked with the 3.—5. instead of arising from the cell. It is possible that the species belongs in the immediate vicinity of *vinacearia*, in which that character is also sometimes variable.

cinerascens. **R. cinerascens** Moore (= *subflavida* Warr.) (5 d). Wings shaped about as in *terrestraria*. Forewing glossy grey, weakly marked; distal area usually somewhat darker, a nearly straight, darkened postmedian band parallel with the distal border, separated from the distal area by a thick pale line or narrow space. Hindwing whitish, tinged with ochreous, towards the anal angle with grey; sometimes unmarked, usually with weak median and postmedian lines, fading out before the costal margin. Underside with the costal and distal areas of the forewing and the whole of the hindwing more or less strongly suffused with yellowish (occasionally more reddish). ♀ smaller and narrower-winged. Apparently common in parts of Kashmir and Afghanistan, June to September. — In ab. *rufilinea* ab. nov. the ground-colour is rather browner, the markings somewhat more distinct, in particular the line which bounds the postmedian band proximally is of a reddish colour, as are also one or two lines on the hindwing beneath (almost or entirely obsolete in the type-form). — *borealis* Swinh., from Kulu, is probably a further form of *cinerascens*, differing chiefly from ab. *rufilinea* in the somewhat fuller colouring and stronger markings, especially the presence of an inner line on the forewing and conspicuous dark discal dot on both wings (both the line and the dot, at least on the forewing, are however sometimes faintly indicated in ab. *rufilinea*). The postmedian line on the hindwing is bent between the first radial and second subcostal veins and is continued to the costal margin; but this too, is traceable in a few extra strongly marked *cinerascens*. I am unable to point out any further differences.

bicolor. **R. bicolor** is apparently an exceedingly variable species, perhaps nothing more than a further series of forms of *cinerascens*, while it is possible, on the contrary, that we are dealing under this name with two or three closely allied species. In general *bicolor* differs from *cinerascens* in having a rather more sinuous and thicker median line on the forewing, in the *bright rosy* colour of this line and nearly always in the presence of additional bright rosy colouring, particularly in the fringes and on the under surface. From all forms of *cinerascens* excepting *borealis*, it also differs in the presence of a distinct, usually strong discal spot in each wing. It occurs in various parts of Kashmir and Chitral, the diverse forms (in respect of coloration and the strength of the lines) being perhaps partly racial, partly aberrational. — *bicolor* Warr. is a glossy form with the costal margin of the forewing as a rule rather strongly rounded near the apex, the three lines always well developed, except in the ab. *suffusa*. Ground-colour of forewing dull olivaceous grey, middle line thick and always rosy, the other lines (especially the outer) occasionally almost plain dark grey, or only weakly shaded with rosy; fringe of the ground-colour or somewhat suffused with rosy — more strongly in WARREN's original than in any other which I have seen. Hindwing with the lines not closely approximated, the outer usually stronger and more complete than the inner. Underside with only the outer line of both wings distinct, thick, rosy; proximal half of

fringes grey, distal half grey slightly or moderately tinged with rosy. Kukli (N. W. India), August, 1891; also a series collected by THOMPSON in the Palearctic Himalayas (without exact locality) in the LEECH collection. — *ab. suffusa ab. nov.* has the rosy suffusion spread over the entire forewing. WARREN's original ♀ belonged to *suffusa*. this form, and he supposed the difference to be sexual; but both forms occur in both sexes in the same locality. — *rhoda subsp. nov.* (7a) is slightly narrower-winged, less glossy, the forewing with the costal margin narrowly or broadly rosy, the fringes of both wings nearly always strongly rosy above and beneath. Ground-colour rather variable, either like that of *vibicaria* or darker, olivaceous grey. The red median line as bright as in *meonaria*; in itself thinner than in typical *bicolor*, but usually extended, especially in the ♀, into a red band; the inner and outer lines suppressed in the ♂, more or less developed in the ♀. Hindwing with the lines near together, the inner often tinged with rosy, in any case better developed than the outer. Underside of hindwing with both lines equally developed, rosy, not very thick, in the ♂ weak, in the ♀ stronger. Chitral, Kokser, Goorais Valley, July-September, a short series in the British Museum collection. Except for the shape and the still brighter markings this form (or species) would come quite near to *adauctata* Stgr.

R. poliaria *Hmps*n (1a). differs from the more strongly marked forms of *cinerascens* in having the edges of *poliaria*. the outer band sinuous and dentate. Ground-colour grey to yellow-grey, inner line of forewing well developed, dentate outwards on the veins, outer band of forewing distinct, grey-brown. Hindwing similar but more weakly marked, without the yellow tone of that of *bicolor*. Discal spot on both wings very distinct. Underside with both the outer lines present, or with the distal one only, the ground-colour rather darker and greyer proximally to the latter, lighter and browner distally. — *ab. roseata ab. nov.* has the lines, band, fringes, costal edge of forewing and entire under surface strongly flushed with rose-colour. Both the type form and the aberration were taken by LEECH in the Goorais Valley in June and September.

R. inconspicua differs from all the preceding in its reddish brown ground-colour, which approaches that of *staudingeri* (3 d). It is smaller and rather broader-winged than the *cinerascens* group. The inner line of the forewing is gently curved anteriorly, then straighter than in *staudingeri*, the other two lines on both wings rather nearer together than in that species, on the forewing almost straight, on both wings about parallel with the distal margin. Both wings have a distinct dark discal spot. The under surface is similar or rather more brightly coloured, both wings with a dark discal spot and reddish brown postmedian line. — *inconspicua inconspicua*. *Btlr.*, which I have seen from Murree, Dharmasala, Kalapani and Thundiani, has the lines on the upper surface very weak, the space between the second and third not appreciably darker than the rest of the wing. — *subconspicua form. nov.*, probably a distinct race, is rather more brightly coloured, has the lines more distinct, especially the median, and has, as in *staudingeri*, a distinctly darkened band between the second and third. Afghanistan, Chitral and Goorais Valley, in the British Museum collection. Nearly the same form, only slightly less extreme, occurs occasionally at Murree as an aberration.

R. staudingeri *Alph.* (3 d). Quite distinct from all the other species hitherto known. From *inconspicua*, *staudingeri*. with which alone it can be compared in colour, it differs in its larger size, fainter discal spots, broader and more sinuous-edged band, scarcely bounded by darker lines, and its almost unmarked under surface. Ferghana to the Ili district. ALPHÉRAKY's specimen was taken on 15 May, at an elevation of 3500 m.

R. glaucofusa *Hmps*n. (5 d). Of this very distinct species, described by HAMPSON as a *Dysethia*, only *glaucofusa*. a single example, a ♀, is at present known, and as this was taken near Quetta (May, 1904) it falls, strictly speaking, just outside the limits of the Palearctic Region. But I suspect, from its facies, that it will prove to be a straggler from that region, and desire to call attention to it here, while dealing with most of the genus. It is probably related to *cinerascens*, but with whiter ground-colour, uniform on both wings, and with stronger, more greenish markings; the green-grey longitudinal patches, leaving broad pale costal area and pale patch behind the median vein as far as second median branch, are characteristic. Underside paler, with discal spots and weak postmedian line.

R. grumaria *Alph.* is another rather aberrant species. The narrow wings, especially in the ♀, place *grumaria*. it in the same group with *poliaria*, etc., but it does not seem to be extremely close to any known species. Antennal pectinations in the ♂ rather shorter than in most species of the genus. Forewing very pale brownish grey, somewhat darker-dusted in basal and distal areas and along costa; inner line sharply outangled on the folds, inangled on median vein; discal spot black; outer line rather oblique and sinuous, commencing at costa at about 3 mm from apex, accompanied distally by a narrow dark band and this again by an indistinct pale line. Hindwing still whiter, with a single line midway between the small discal dot and the distal margin. Under surface more tinged with reddish, especially the hindwing; cell-spots and traces of outer line present. ♀ very narrow-winged, apex of forewing acutely pointed, of hindwing produced but rounded, distal margin of forewing

strongly oblique, of both wings faintly concave. Only known from the North-East corner of Tibet (Koko-Nor and the Amdo district).

cuprinaria.

R. cuprinaria Chr. (= *phoenicearia* Hmps.) (1a) is another very distinct species, recognizable at once by its more rounded apex, the nearly uniform purplish-coppery hue of both wings and yellowish under-side with a distal border of purplish-coppery on both wings. The lines on the forewing are placed widely apart and scarcely discernible except by fine yellow lines which bound the inner line proximally and the outer distally; for the rest, the position and course of the lines are most nearly as in *vastaria*, the inner rather strongly dentate. Discal spot present on both wings, but indistinct. Occurs in S. E. Armenia, Persia, Transcaspia and Afghanistan. CHRISTOPH's original figure and description are so extremely bad that it is difficult to believe that they represent the same species which he afterwards figured under the same name, and which is now called *cuprinaria*. In case it should prove that he confused two different species, the earlier one (perhaps of the *badiaria* group) must, on its rediscovery, bear his name, and the present one must be called *phoenicearia* Hmps. (erroneously described as an *Acidalia*).

B. Section *Delocharis*. Second subcostal of forewing stalked.

acidaria-group.

♂ hindtibia with 4 spurs. Only the single species yet known.

R. acidaria is apparently a locally variable species, three different races having been made known by STAUDINGER. The shape of the wings and their colour recall *badiaria* and *terrestraria*, or rather (the apex of the forewing being rather acute, the distal margin of the hindwing well rounded) *praecisaria*, and there is probably a really near relationship in this direction, notwithstanding the difference in neururation. The fine and rather straight central line, placed about midway between the others, will distinguish it from all the species of similar size excepting *vibicaria*; from *vibicaria* it differs abundantly in shape, in the sinuous outer line and in the entire lack of rosy colouring. The under surface is extremely weakly marked. — In **acidaria** Stgr. (3d) the ground-colour is pale yellowish grey, the markings moderately well expressed, the additional line which accompanies the median line distally sometimes much fainter than in the example figured. Ferghana, Thian-Shan, Issyk-Kul. — **grisearia** Stgr. (3d) from further south-west (Transalai) is darker in colour and at the same time more strongly marked. — **alexandrararia** Stgr. from south-west of Issyk-Kul, is unknown to me, but is described as being of a more reddish-yellow ground-colour and more weakly marked than *acidaria acidaria*, the inner line being entirely absent, the outer only occasionally present; the under surface is much more reddish. According to STAUDINGER, the species appears to be very common throughout central Asia.

herbicolens-group.

♂ hindtibia with 3 spurs.

herbicolens.

R. herbicolens Btlr., on which BUTLER founded his genus *Delocharis*, is closely similar to *acidaria* in colour and markings, both above and beneath, but is considerably smaller (size of *vinacearia*), the costal margin of the hindwing relatively longer, the dark shading which follows the median line on both wings usually stronger and broader, forming more or less of a band, and the distal area often more noticeably dark-shaded. North-muricolor. West India. — ab. **muricolor** Warr., though described from Simla, will probably occur also in Palearctic localities. It has the forewing of a greyish mouse-colour, the markings obliterated excepting a slight black cell-spot; hindwing paler, hence retaining traces of the two transverse lines.

tristigalis.

R. tristigalis Btlr. (3e) is another of the smaller species, probably related to *vinacearia*. The ground-colour is dull reddish ochreous, the markings darker, with a more or less strong rosy tinge. The middle line, as in *acidaria* and *herbicolens*, is double, usually more or less united by dark shading into a narrow band. This character, together with the less sinuous outer line and the minute or obsolescent cell-spots will at once distinguish it from *vinacearia*. The name of *tristigalis* was not happily chosen, as it is the one species of the genus which can be said to have four lines on each wing. Under surface brighter red-ochreous, about as in *inconspicua*, the markings nearly as above, but weaker, the inner line of both wings wanting. Dharmasala and Sultanpur.

rara.

R. rara Btlr. (3e) differs from *tristigalis* and *vinacearia* in its brighter ochreous ground-colour (our figure of *vinacearia* ab. *stigmatica* is too yellow), absence of inner line, at least on the hindwing, and more denti-

culate, usually more interrupted outer line of both wings. Moreover the apex of the forewing, particularly in the ♀, though acute in all the three allies, is the most prominently so in *rara*. The underside of the forewing is suffused with grey or red-grey basally, the rest of the markings nearly as above. Dharmasala. A separate race which occurs in Sikkim (*olivacea* Warr.) will be discussed in Vol. 12. *olivacea*.

R. vinacearia Moore evidently belongs to this section of the genus, and most specimens conform to our characterization in respect of the point of origin of the second subcostal; but occasionally this vein arises from the cell, though close to the point of origin of the 3.—5. subcostal, and forms herein a troublesome irregularity in the application of our scheme. Concerning the name-type of this species, described from Bengal and therefore not coming within the Palearctic fauna, it is necessary to say a few words here because the law of priority necessitates its acceptance. Unfortunately it represents a very rare form of the species with the ground-colour darkened (reddish ochreous) and the lines weak, so that at first glance it looks almost unicolorous. It may represent a local race, but more probably a mere aberration. — ab. *stigmatica* Btlr. (3 e) seems therefore the correct designation of the common form, in which the ground-colour is clear light greyish ochreous, not or scarcely darkened with reddish, and with the red lines, costal margin of forewing and fringes standing out distinctly. The position of the markings is sufficiently shown in our figure, but a basal line is usually present on the hindwing also. The simple median line of the forewing and the sinuous outer line of both wings distinguish it from the two preceding; on the hindwing the median line is occasionally double, but its outer part scarcely ever so strong as in our figure. The under surface, like that of *rara*, has some dark clouding in the basal area of the forewing. Dharmasala, Sultanpur and no doubt other localities in the same district. — *curvata* Warr., described from Bhotan, seems to differ very little, and will probably be found as an aberration in Palearctic localities. It is described as dull ochreous cinereous, the costa hardly darker, the cell-spot small. — *sinensis* subsp. nov. More tinged with dull rufous than the other forms, the fringes concolorous, not rosy, the lines reddish-brown, not rose-colour; middle line even straighter than is usual in *vinacearia*, outer line more deeply sinuate, discal dots smaller; a faint oblique dark shade from distal margin close to apex; under surface without the dark clouding at base of forewing. In addition, forewing appears slightly broader, its distal margin is slightly less straight (more convex) and that of the hindwing is less regularly rounded, being appreciably, though extremely slightly, bent at the third radial. Very distinct in aspect, superficially suggesting a light *Tanaotrichia prasonaria* Swinh. more than a *Rhodostrophia*. Perhaps a distinct species. Moupin, July, 1890, the type ♂ and a quite similar ♀; Chang Yang, June, 1888, a very worn ♂ and ♀; all from the LEECH collection, now in that of the British Museum. *vinacearia*. *stigmatica*. *curvata*. *sinensis*.

R. philolaches is a rather broad-winged species which cannot possibly be confused with any other of the genus. Almost the only other plain grey species, *cinerascens*, has much narrower wings and of a more glossy texture; and even *badiaria* and one or two others which in their greyest forms might approach the ground-colour of *philolaches* have not its well-rounded hindwing. The strongly zigzag inner and outer lines also separate *philolaches* from all its allies, and a more detailed description is unnecessary. Flies in June and July. — *philolaches* Ob. is the form from South-West China (Ta-chien-lu, Moupin, Ni-tou) and is distinguished by the plain grey colour, with scarcely any tinge of yellowish. — *tibetaria* Stgr. (= *farinosa* Warr.) (3 e), from Koko-Nor and Amdo, differs very little, but is, at least generally, of a more yellowish tone. The difference, however, is not striking, and WARREN, who described the ♂ of his *farinosa* from Koko-Nor and the ♀ from Ta-chien-lu, did not even remark on any sexual dimorphism. I have compared his ♀ with OBERTHÜR's figure. Of 8 examples of this species before me, one has the second subcostal of the forewing arising from the cell, though quite near to the point of origin of the third to fifth. *philolaches*. *tibetaria*.

R. bisinuata Warr. is unknown to me, the type specimen having been mislaid. It may possibly be a *bisinuata*. *Tanaotrichia*, and on account of the uncertainty I have left it to the end of the genus; but it is very likely that its true position is next to *vinacearia*, and it may even be a form of that species or of *sinensis*, if the latter be specifically distinct. The description is not very full, but the shape would apparently be that of *vinacearia*, or even of *rara*. "Dull ochreous cinereous, very much like *R. curvata* Warr. (= *vinacearia* Moore, fide HAMPSON), but the forewings more pointed and the submarginal line twice sinuate, not simply curved, as in the Indian species just mentioned, nor with a single sinus as in *trilineata* Warr. (= *Tanaotrichia prasonaria* Swinh.). One ♀ from Japan, the same size as *curvata* Warr.".

2. Genus: **Apostates** Warr.

Characters of *Rhodostrophia*, but with the distal wall of outer areole (the base of the stalk of the 3. and 4. subcostal veins) obsolete, resulting in a very abnormal phenomenon which has otherwise only been

observed in a few *Larentiinae*; the complete separation of the 5. subcostal from the others. Thus the genus, though evidently an offshoot of *Rhodostrophia* (Section A), has actually only a single areole, formed by the anastomosis of the 1. subcostal with the 2. Created for the reception of a single species, of which I have only seen two examples, so that I cannot say quite positively whether the peculiar neurulation is constant; if not, the genus must sink to the preceding. CHRISTOPH, who placed his species with a query in *Fidonia*, did not notice any abnormality; the number of hindtibial spurs in the ♂ is not known to me, as CHRISTOPH's and WARREN's specimens and one in the British Museum are all ♀.

solitaria.

A. solitaria Chr. (= *albiclathrata* Warr.) (7a). Brown, with the costal margin of forewing broadly pale ochreous, the veins also pale; forewing with three pale transverse lines, the middle one broadened into a band anteriorly and containing the dark, elongate cell-mark, the outer sinuous, running to the anal angle, distal margin pale; hindwing ochreous, dusted with brownish posteriorly, median line faint, submarginal and marginal, as well as the cell-spot, as in forewing. Transcaspia and Ili district, apparently scarce and local.

3. Genus: **Tanaotrichia** Warr.

Nearly related to *Rhodostrophia*, the forewing rather broader than in most *Rhodostrophia*-forms, about as in *vinacearia sinensis* and *philolaches*. Hindwing with distal margin rounded. Palpus rather short, upcurved. Hindleg in ♂ without median spurs and with only a single well-developed terminal, the other greatly abbreviated, perhaps sometimes wanting; a strong hair pencil from femoro-tibial joint and some short, compact tufts arising near the spurs, looking, without close examination, like two additional spurs. ♀ with 4 spurs. Second subcostal of forewing arising from the cell, though sometimes at the same point with the stalk of the 3.—5.

The type of the genus, *prasonaria* Swinh., does not occur in the Palearctic Region. The species thus identified by LEECH is new, and is described below.

orientis.

T. orientis sp. nov. (= *trilineata* Leech, nec Warr.) (1a). Smaller than *prasonaria*, apex rather less acute, ground-colour light yellowish brown entirely without red admixture, on the other hand finely and minutely dusted with fuscous. Lines fuscous; the first further from the base than in *prasonaria*, excurved not straight; the second followed by distinct fuscous shading; the third more gently and regularly bisinuate, without the strong, single posterior curve of *prasonaria*; distal area of forewing except at apex shaded with fuscous; discal spots wanting. Underside with the lines fine, forewing from base to beyond middle, except at margins, clouded with fuscous. Che-tou, W. China, 3360 m, July or August, 1890. May possibly prove a form of the doubtful "*Rhodostrophia*" *bisinuata* Warr., mentioned above.

4. Genus: **Somatina** Guen.

Palpus in both sexes short or quite moderate, the terminal joint not elongate. Antenna in ♂ usually with fascicles of cilia, which only exceptionally arise from (short) pectinations. Hindtibia in ♂ without spurs, usually shortened and thickened and with strong hair-pencil; in ♀ with 4 spurs. Forewing with areole double, the 2. subcostal stalked with the 3.—5. Hindwing with the 2. subcostal and 1. radial separate or very shortly stalked, 2. radial sometimes arising rather near the anterior angle of cell, as in the *Hemitheinae*.

Early stages apparently unknown.

Concerning the geographical range of this genus I am unable to give exact information at present, as I cannot delay the present work until I have completed my survey of the allied forms of the other continents. All the four great regions produce forms with the same essential structure as regards palpi, spurs and the double areole, but there is a good deal of divergence in the antennae and some details of leg structure and of neurulation, which may or may not prove to be of generic value. I have in the mean time given to GUENEE's wellknown genus a rather wide extent, including in it several species which HAMPSON would have called *Erythrolophus*. He overlooked in his "Moths of India" that the type species of the genus *Erythrolophus* has a long terminal joint of the palpus, especially in the ♀; while his other distinction, the point of origin of the second radial of the hindwing, only applies to a few *Somatina* species and would, indeed, have excluded the type of the genus! At least it can be stated that the most typical species of the genus are Indo-Australian, that it is wanting in Europe, but that a few aberrant stragglers extend into Palearctic Asia. *Dithalama* Meyr. may be a synonym, and has been so regarded by TURNER; but in its type-species the 2. subcostal of the forewing arises from the cell, and there are other slight differences. I mention the name because MEYRICK and others have applied it to *indicataria* Walk., in which the 2.—5. subcostals are stalked.

indicataria.

S. indicataria Walk. (5a). White, marked with grey and on the forewing with a thick brown median line curving round the elongate, thick black cell-mark, but not or scarcely reaching the costal margin; inner

line weak, rather far from the base; distal area with pairs of rather large, proximally confluent spots between the radials and near the posterior angle, pairs of smaller spots in the other cellules nearer to the distal margin, and a chain or band of still smaller spots at the margin itself. Hindwing with a thick median line which makes a deep curve round the proximal side of the black cell-spot; some dark clouding basally hereto; a dentate postmedian line followed by a series of large oval blotches; a marginal chain of spots larger than those of the forewing. Under surface quite weakly marked except for the discal spots and median lines. Eastern Siberia, Korea, Japan and West China; April, May and again in August. A very distinct species; the shape and facies suggest that possibly a form akin to this was the parent of the genus *Problepsis*.

S. mendicaria *Leech* (5 f). Leaden grey, with darker, wavy transverse lines and dark discal spot, and *mendicaria* with a paler submarginal line. Underside paler, with a weak outer line present. Vertex of head white. In the ♂ antenna the fascicles of cilia are placed on short pectinations; the hindleg, though without spurs, is not aborted. In shape and facies the species slightly recalls *Dithecodes idaea* *Swinh.*, but is larger and differently coloured, besides some structural distinctions. *LEECH* described this and the following as *Acidalia*, overlooking the neururation. Chang Yang and Moupin. July.

S. centrofasciaria *Leech* (5 f). Brownish ochreous. Forewing with dentate dark antemedian line; both *centrofas-* wings with thick purple-brown median line or shade, a finer, weaker, lunulate-dentate outer line and a blackish *ciaria*. discal spot, that of the hindwing placed on the median shade. Under surface paler, with the markings faint; base of forewing tinged with purplish grey costally. The type ♀, taken at Chang Yang in June, remains unique, but there can be little doubt as to the systematic position of the species. The shape, the palpus and the neururation all indicate its affinity with the preceding.

5. Genus: **Craspediopsis** *Warr.*

A small genus, created by *WARREN* for a few Indian species, differing from *Somatina* in the strongly pectinate ♂ antenna and in having the hindwing slightly angled at the 3. radial instead of rounded, but apparently agreeing in the rest of the structural characters. In coloration and markings, however, the species strongly resemble *Acidalia*, except in their large size. The point of origin of the 2. subcostal of the forewing is variable. In the type species, which is Indian, it is stalked, as in *Somatina*, but in the three Palearctic species it arises from the cell, or in *persimilis* sometimes from the same point as the 3. to 5. The genus is only known as yet from Northern India and Western to Central China.

C. persimilis *Moore* (1 a). Size of *sinuosaria* or larger, the tail at the third radial of the hindwing rather *persimilis*. slight, but the whole distal margin of this wing crenulate. Pale brownish grey, irrorated with fuscous. First (on forewing only) and second lines marked by dark spots on the veins, the second line sinuate inwards between the radials and near posterior margin, accompanied by some slight dark shading distally. A dark discal spot, rather large but indistinct on the forewing, followed on both wings by an ill-defined, subdentate median shade, which is angled outwards at the first radial and incurved behind the cell. Distal margin more or less distinctly black-marked between the veins; fringes with distal black dots opposite the veins. Beneath the hindwing is paler than the forewing, the first line is wanting, the other markings distinct, the outer line on both wings not broken up into spots. Dharmasala, Sultanpur and other localities in N. W. India.

C. acutaria *Leech* (5 e). Whitish brown with the markings fuscous. Forewing with indistinct inner line, *acutaria*. marked with black dots on the veins; oblique central line, incurved behind median vein; outer line angled on subcostal, marked with black vein-dots and followed by a dark blotch at posterior margin; base of fringe with black dots opposite the veins. Hindwing without the first line and posterior blotch. Both wings with black discal spot. Under surface without the inner line, forewing instead shaded with fuscous in basal half. Markedly smaller than the other species, the tail at the 3. radial of the hindwing more pronounced. Chang Yang, Ichang, Kwei-chow and Omei-Shan. Flies in June.

C. sinuosaria *Leech* (5 d). This interesting species, doubtfully described by *LEECH* as a *Rhodostrophia*, *sinuosaria*. has the hindwing scarcely elbowed at third radial, the ground colour similar to that of the preceding, but, apart from its larger size, is altogether differently marked, and indeed cannot be confused with any known species. The triangular discal spot and the sinuous, dark-bordered outer line are distinctive; the latter spotted with black on the veins. On the under surface the markings are less distinct, but the basal half of the forewing is suffused with fuscous. Pu-tsu-fong, W. China, taken in June. The ♀ is unknown.

6. Genus: **Dithecodes** Warr.

Palpus short. Antenna in ♂ ciliated. Hindtibia in both sexes with a single pair of spurs. Forewing with areole double, the 2. subcostal arising from the cell or stalked. Hindwing with distal margin slightly elbowed in middle, or rounded, the 2. subcostal connate or very shortly stalked with the 1. radial.

Notwithstanding the slight structural variations noted above, this is evidently a natural genus, agreeing not only in the double areole and tibial armature, but even in the prevalence of dull greenish colouring, white discal mark on hindwing and approximate size and shape of the species. The genus received two, or probably three names in the course of the same year (1900), but the one here adopted was published earliest. *Mnesithetis* Swinh. is certainly a synonym, or at most a subgenus of it; *Neosterrha* Warr. probably a subgenus, with very long fascicles of cilia on the ♂ antenna, but I have unfortunately not seen a ♀. The last-named section is Neotropical, the other species belong to the Indo-Australian and African Regions, excepting the one or two Japanese here given.

erasa.

D. erasa Warr. Both WARREN's type (♀) and a second ♀ which seems to agree with it are in wretched condition, and it is impossible to give a perfect description, or to say definitely whether the species really differs from the following; I am inclined to suspect that they will prove to be forms of one and the same. Wings dull pale greenish (fading to yellow), apparently without markings. Under surface paler. Face and upper side of palpus blackish. Wing-expanse 30 mm; wings moderately broad, hindwing bluntly elbowed at 2. radial. The type-specimen, in the Tring Museum, is from Japan, without more exact locality; the second example, at the British Museum, from Tokio.

vacua.

D. vacua Swinh. Of this species, described by its author as a *Hemithea*, I have also only seen two or three poor specimens, though not so deplorably bad as the preceding. Except that they have a large white discal spot on each wing and faint traces of a curved postmedian darker line, the former less prominent beneath on account of the paler ground-colour, I can see no difference. The types in the British Museum are merely labelled Japan; but a ♀ specimen in my collection, for which I have to thank the generosity of Dr. E. A. COCKAYNE, was taken at Nikko on 4 September, 1910, and WILEMAN has recorded one from Oyama, Sagami, June, 1896.

7. Genus: **Anisephyra** Warr.

Face often protuberant. Palpus rather stout and rough-scaled, terminal joint short. Antenna in ♂ rather strongly bipectinate, with apex simple. Hindtibia in both sexes with all spurs. Forewing with areole simple, usually not very long, the first subcostal arising beyond the apex of the areole, often much beyond, not infrequently opposite the fifth subcostal. Hindwing not tailed or sharply angled at extremity of second radial, though sometimes very slightly bent; costal vein anastomosing with cell for a point or more, rather gradually diverging, second subcostal from apex of cell or short-stalked, first median separate at its origin from third radial.

An interesting little genus as probably standing somewhere near the phylogenetic base of the *Cosymbia* section. The tendency to reduction in the length of the areole and longer anastomosis of the first subcostal with the others as well as the scheme of markings (often with large or ocellated discal spots) are indications of affinity with that section, and it is not impossible that the discovery of the early stages will necessitate its removal thereto. On the other hand, in spite of its different habitus, its organic characters do not seem greatly different from those of the two following genera. The stouter palpus and some slight neurational characters are perhaps the chief distinctions. The few known species belong to the Indo-Australian Region, and even the one here introduced only reaches the borders of the Palearctic.

brunnearia.

A. brunnearia Leech (5 f). Light brown, with a slight fleshy tinge. Forewing with small black dots on the veins indicating the position of the first line. Both wings with median shade and black-dotted postmedian line; the former on forewing weakly curved in S-shape, placed well beyond the cell, on hindwing crossing the cell-spot; the latter outcurved or outangled in middle. Dark discal spots, that of hindwing somewhat enlarged, containing a pure white pupil. Under surface similarly marked, both the discal spots sometimes light-pupilled, but neither distinctly so. Hindwing distinctly elbowed in middle, costal vein anastomosing at a point, then rapidly diverging, first median close to third radial at origin; thus not a typical *Anisephyra*. Western China in June.

8. Genus: **Ptochophyle** Warr.

Face smooth. Palpus short, smooth-scaled. Antenna in ♂ bipectinate with very long branches, the apical extremity simple; in ♀ variable (pectinate or subpectinate only in the subgenus *Heteroctenis* Meyr. from Borneo). Hindtibia in both sexes with all spurs. Both wings with distal margin usually more or less bent in middle, hindwing sometimes crenulate and with small tail at end of third radial. Areole simple, the first subcostal anastomosing at a point or more strongly with the stalk of the others. Hindwing with cell short (about two-fifths), costal normal, second subcostal and first median either from the angles of the cell or shortly stalked.

The genus consists of a number of Indo-Australian species, for the most part small and brightly coloured, and divided by WARREN into two genera, *Ptochophyle* and *Chrysolene*. They were first united by SWINHOE in 1902, and this course appears correct. One or two species straggle into Africa, and a single one, *miniosa*, is said to occur in North China, though this seems open to some doubt. On the assumption that the locality is correct, it is described and figured here.

Pt. miniosa Warr. (5 d). Bright red, slightly mixed with yellow; antemedian and postmedian lines *miniosa*. yellow, ill-defined and interrupted, on hindwing not or scarcely discernible; discal spot of forewing dark, dull red, that of hindwing yellow, elongate; distal margin yellow, the red ground-colour encroaching somewhat in the middle; fringe yellow. Under surface unmixed with yellow, weakly marked; fringe yellow. WARREN'S type specimen came from Penang and the species is chiefly Indo-Australian, but an old example stands in the British Museum collection with the label "North China", which there usually indicates the neighbourhood of Shanghai. Although there is some possibility of a mistake in labelling, a few Indo-Australian species undoubtedly do reach Shanghai, at least as stragglers.

9. Genus: **Timandra** Dup.

Palpus rather short, smooth-scaled, terminal joint distinct, relatively not very short. Antenna in ♂ strongly bipectinate, apical end simple. Hindtibia in both sexes with all spurs. Forewing with apex acute, usually somewhat falcate, distal margin not or scarcely convex, areole simple, the first subcostal occasionally anastomosing briefly with the stalk of the others, but rarely, the distal wall of the areole being much more usually formed by the second subcostal. Hindwing with apex pronounced, distal margin produced to a tail at end of third radial, cell one-half or slightly less, second subcostal from apex of cell or extremely short-stalked with first median from close to third radial.

Egg rather regularly oval covered with small oval pitting; yellow at first, becoming red. Larva rather rugose and unequally thickened, head and first two thoracic segments rather small, metathorax widening, first abdominal much swollen and laterally dilated, the remaining segments slightly swollen at sides. Feeds on dock and other low plants, passing the winter in the larval state. Pupa slender, much angulated, recalling those of some butterflies; acutely pointed anteriorly, the covers of the tongue and legs very long, abdominal segments long, anal extremity with two hooks. In a slight cocoon.

The genus is a very natural one, the species being nearly all exceedingly similar, both in structure and in markings. They inhabit chiefly Asia, one species extending also commonly into Europe; a single species is North American. The name of *Timandra* has been very generally used for this genus, and seems correct. I formerly followed PACKARD, ROGENHOFER and MEYRICK in substituting *Calothysanis* Hbn., which is older. But I find that BUTLER in 1881 chose *Acidalia imitaria* as the type of *Calothysanis*, and already GUENÉE had applied the name similarly. The selection, though bad, must be accepted.

T. amata is the best known and by far the most widely distributed species, its range extending nearly throughout Europe (excepting the most northerly localities) and the greater part of Palearctic Asia, where it is still quite common as far eastward as Japan. It varies considerably, but is generally one of the most beautiful species of the genus, on account of the bright pink colour of the fringes, which also extends at times on to the distal margins of the wings. The ground-colour is pale yellowish brown, often dusted with grey; forewing sometimes with, sometimes without a weak, curved brown-grey inner line, both wings with grey distal line, making a gentle (sometimes rather stronger) outward curve in the middle; a thick grey line, more or less strongly overlaid with rose pink, running obliquely from apex of forewing to middle of inner margin of hindwing; a small discal spot (often very indistinct) on forewing. Under surface more thickly dark-speckled, the inner line of forewing wanting, the oblique line not overlaid with pink, often weakly expressed. Face dark reddish. The early stages have already been partly described under the genus, as it is safe to assume that the form will characterize the whole of the species. The larva of *amata* is brown, marked with paler and darker, the dorsal line pale,

narrowly dark-centred, dorsal patches on the first to fifth abdominal segments, each pointed at its anterior end and truncate at its posterior. I have found it feeding among the seeds of dock, and it is easily obtained by rearing from the egg. Pupa light brown, dark spotted, the wing-veins dark. There are, at least in favourable seasons and localities, two broods of the moth, the hibernated larvae producing the imagines about June, while a part of the offspring of these feeds up quickly, moths appearing again in August-September. In the height of summer the egg has been known to hatch very quickly, only 4 or 5 days after being laid. The moth frequents rank, weedy places at the edges of fields or the borders of woods, or hides by day in hedges. It is easily disturbed, but in cool weather drops to the ground instead of flying, and in any case it does not fly far. The natural time of flight is at or after dusk, when it may be captured with the net, usually flying rather near the ground. —

- amata*. **amata** L. (= *amataria* L. = *vibicaria* Hufn., nec Cl. = *angulata* Geoff.) (5 f) is the common European form with the speckling usually comparatively slight, the pink of the oblique line rather bright but not extended. Second-brood specimens are smaller and still freer from dark dusting, approaching the extreme forms described under *comptaria*. — *ab. effusaria* Klem. is strongly dusted with grey, the pink of the oblique line very broadly diffused distally, the outer line very distinct. SEPP has figured an extreme example, with the entire hind-wing suffused with rosy. — *ab. roseata* Hirschke is of a uniform reddish-grey tone, with the oblique line obsolete. — *ab. deleta* Rbl., perhaps not really separable from the preceding, is described as almost without markings, the fringes red. It is founded on a figure by GEYER in HÜBNER's well-known work, which is not of an unusually reddish tone of colour. — *ab. nigra* Rbl., founded on a specimen in the CAPPER collection, is uniform smoky brown, with only the tips of the fringes pinkish. BARRETT's figure of the specimen seems a little too dark, and this has misled REBEL into describing it as black; but in any case it is a very remarkable form. In "The Entomologist", vol. 26, p. 65, it was described as "unicolorous soft olive-green". — *ab. suffumata* *ab. nov.*, described by BARRETT from the collection of the Rev. J. GREENE, is of a uniform pale smoky grey, but with the oblique line present. — *ab. bipartita* *ab. nov.* is normally coloured proximally to the oblique line, but the entire area beyond it is smoke-coloured on both wings, only becoming paler again just before the pink fringes. Figured by MÖBIUS in "Iris", vol. 18, pl. 2, fig. 5, a similar example described by AIGNER-ABAFI, Ann. Mus. Nat. Hung. vol. 4, p. 527. — **grisearia** Petersen, rather large, strongly dusted, lines reddish grey, not pink, is said to form a local race in the Baltic Provinces, but occurs as an aberration elsewhere. — **comptaria** Walk. is a dwarf race from China and Japan. WALKER's type is moderately dark-speckled, but a rather larger percentage of the specimens are free from speckling, the pink line and margins bright and often extended. April onwards, thus not merely a second-brood form. A larger, heavily speckled form from Japan still needs closer investigation (? = *grisearia* Petersen). The species would perhaps be a suitable one for temperature experiments.

convectaria. **T. convectaria** Walk. (1 a) differs from *amata* in the following characters: antennal shaft and basal half (or more) of costa of forewing fuscous; wings more tinged with ochreous or reddish, the oblique line with rufous, not pink; fringes darkened; forewing with distinct dark dots on the 4. and 5. subcostals close to apex; hindwing with rather sharper tail. Widely distributed in India, not hitherto recorded as Palearctic. I have, however, received a ♂ from Chungking, taken at the end of May, 1910.

correspondens. **T. correspondens** Hmps. (1 a) is nearly related to the preceding, agreeing with it in shape and in the darkened costal margin. The ground-colour, however, is that of *amata*, the oblique line and fringes ferruginous, the antemedian line of forewing well-defined, quite straight, the postmedian with the outward curve very weak, that of the hindwing still less curved, often quite straight. Discal spot nearly V-shaped. Under surface nearly like upper. Apparently not variable. Described from Dharmasala, occurs also in Sikkim and Assam. The only dated specimen which I have seen was captured at the end of June.

extremaria. **T. extremaria** Walk. (= *sordidaria* Walk.) (5 f) differs from *amata* in the shorter palpus, more blackish face, the apex of the forewing somewhat more falcate, of the hindwing somewhat more square; the oblique line is rather thick, dark grey overlaid with dull reddish, the other lines very weak, reduced to mere dots on the veins; fringes concolorous with wings and without a dark line at their base. Under surface similar, more strongly speckled, the oblique line not tinged with reddish, a dark distal marginal line. Distributed across China from Omei-Shan and Chungking to Ningpo, occurring from June to September. Also in Formosa.

T. rectistrigaria, though otherwise normal in structure, is the most aberrant species of the genus in shape, the forewing stumper, with distal margin less oblique and more convex, the hindwing with the tail at the 3. radial very slight, a faint concavity from here to the 2. subcostal, hence a bend at this latter vein also. Ground-colour dull white, profusely and coarsely spotted all over with grey-brown, sometimes almost without markings, at other times with the oblique line and outer line present, though never extremely sharply expressed; the former, when traceable throughout, is seen to start from the costa slightly before the apex, and reaches the inner margin of the hindwing further from the base, nearly meeting the outer line; the latter, when present,

is formed nearly as in *amata*; cell-spot weak, elongate. Underside similar, the oblique line still weaker, the cell-spot stronger. I am acquainted with too little material to say whether the variation is in large measure sexual or geographical; it is certainly not entirely sexual, as is suggested by HEDEMANN and by STAUDINGER's citations. — *rectistrigaria* Ev. (= *puziloi* Ersch.) is the form with the transverse markings present, and is apparently the commoner, at least in the provinces of Irkutsk, Transbaikal, etc. According to ALPHÉRAKY, all the specimens collected by HERZ at Witim belong to this form. On the other hand a ♂ from Amurland figured by HEDEMANN belongs to the following form. It will probably prove that the ♀♀ are on an average the more strongly marked. — *obsoleta* form. nov. (5 g). I propose this name for the form with all the markings obsolete, which is the only one yet known from Kamtschatka, and which ALPHÉRAKY suspected would prove to be a local race is that country. But, as shown above, it also occurs as a ♂ aberration in Amurland, while on the other hand it is possible that some ♀♀ from Kamtschatka will prove to show at least traces of the markings.

10. Genus: **Problepsis** Led.

Palpus usually rather slender, with appressed scales; terminal joint distinct, in ♂ very small, in ♀ somewhat longer. Antenna in ♂ pectinate or dentate, the teeth ending in fascicles of cilia; in ♀ shortly or minutely ciliated. Pectus more or less hairy. Femora sometimes hairy. Hindtibia in ♂ much dilated, with strong hair-pencil, spurs wanting; in ♀ with all spurs. Hindtarsus in ♂ abbreviated. Wings always bearing some metallic, silvery scales. Forewing with areole simple, first subcostal arising at or just before its apex; third discocellular incurved; first median arising from cell. Hindwing with costal anastomosing with cell at a point or rather more, then rapidly diverging; second subcostal arising from cell; discocellulars straight; first median arising from cell.

An exceedingly natural genus, showing very little structural variation except in the ♂ antenna and the degree of hairiness of the pectus. Fortunately those species which would be the most difficult to differentiate from *Acidalia* by the antennal structure are just those which have the pectus most densely hairy. But in any case the stronger build, the wing-pattern and especially the metallic scales would distinguish all the species from *Acidalia*. The genus is a direct derivative of *Somatina*, the only essential difference being that the areole is simple.

The species are scattered in the Palearctic (except westward), the Indo-Australian and the Aethiopian regions, but are not very numerous. Information is wanting regarding their habits and life-history.

A. ♂ antenna bipectinate.

P. ocellata Friv. (= *ommatophoraria* Guen.) (5 a). In this species, the type of the genus and a very *ocellata*. good representative of its usual type of markings, the ground-colour is of a less clear white than in most of the others, being somewhat tinged with brown. The forewing bears a rather ill-defined inner line, strongly bent or angled behind cell; a very large roundish-oval central ocellus, reaching from the subcostal vein to the submedian fold and about one-third as wide as the length of the wing, its outside ring dark brown and regular, its colour within light brown but containing two whitish anterior and two black posterior wedge-shaped spots, a ring of metallic, partly black-edged spots within the dark-brown ring and a few minute metallic spots on the black wedges; a small dark patch between the ocellus and the posterior margin; a strongly curved fuscous brown line near the distal margin, followed by a row of interneural spots and these again by smaller spots. Hindwing without proximal line, the ocellus drawn out so as to reach the inner margin, some of the metallic spots enlarged, but the black ones wanting; postmedian line parallel with the distal margin, followed as in forewing. Under surface with the principal markings showing through very faintly from above. Vertex of head fuscous. Very local, from Greece and Crete to the Taurus and Syria. — The form *cinerea* Btlr., from Campbellpur, perhaps scarcely constitutes even a local race. It is slightly more brownish in tone and has the ocelli broadened, especially on the hindwing.

P. deliaria. Ground-colour pure white, inner line entirely wanting, ocellus nearly always narrower than in *ocellata* and more irregularly shaped, the ring surrounding it much lighter brown; outer line also lighter brown, usually thickened, the spots beyond it larger but lighter; posterior margin of forewing in basal half more or less strongly marked with silvery scales. On the hindwing the ocellus is still further narrowed, and scarcely deserves that name; often the brown shading which characterizes it in most of the species here becomes very weak, and the most prominent markings are the silvery rings (the larger one, much elongate, reaching to just beyond the second median vein, and a second, small one at the abdominal margin, but both generally

more or less imperfect). Under surface with the ocelli showing through, but not very distinct. Vertex of head *deliaria*. fuscous. Antennal pectinations in the ♂ of medium length, apical one-third not pectinate. — *deliaria* Guen. (5 a) is the normal Indian form, as described above, the ocellus of the forewing apparently always elongate, the markings usually distinct; the average size of the form is not very much larger than that of *ocellata*. I have no Palearctic examples before me, and am not quite certain, though I think it probable, that it reaches *albidior*. this Region. LEECH gives several localities, but his specimens belong to other, closely allied forms. — *albidior* Warr. is perhaps a distinct subspecies, possibly a mere aberration, differing chiefly in the broader, more rounded ocellus of the forewing. The size is, on an average, somewhat larger, the markings often weaker. Kulu, Ichang, ? Satsuma.

vulgaris. **P. vulgaris** Btlr. (7 b), which reaches the confines of the Palearctic Region at Kangra, and perhaps elsewhere, but which extends southwards through India to Ceylon, is closely related to *deliaria*, agreeing in structure and general facies, but differing as follows: rather smaller, the median markings darker, the spot on posterior margin of forewing prominent, usually almost or altogether united with the ocellus to form a band, at least as narrow as in the narrowest-marked *deliaria*, the ocellated part with its proximal edge usually somewhat concave and always bordered by a thick black mark which is entirely wanting in *deliaria*.

eucircota. **P. eucircota** sp. nov. (7 b). Antenna in the ♂ with the pectinations very short, scarcely as long as the widest diameter of the shaft, thus transitional towards group B, in which they are reduced to mere teeth; those of the ♀ with longer, more bristly pairs of cilia than in the other species. Forewing with the ocellus nearly round, without a dark outer ring and not margined by a black mark proximally; containing, near its outer edge, a complete silvery ring, within which there are two black, wedge-shaped markings placed as in *ocellata* and usually some silvery scales longitudinally at the second and third radials, only a very small spot in the centre whitish; outer line rather thick, the spots distally to it unequal in size, only the pairs between the radials and at the hinder angle being large, usually confluent; inner margin with the customary brown spot moderately dark, bearing a few silvery scales. Hindwing with the ocellated mark similar to that of *ocellata*, slightly broader and darker. Under surface sometimes weakly marked, but usually with the ocelli and outer line conspicuous and the costal area of the forewing somewhat infuscated. Vertex of head black, antennal shaft blackish basally. Shanghai (2 ♂, 2 ♀, September, 1892), Ningpo (2 ♂, July, 1886), Chia-ting-fu (♂, July, 1889) all in the British Museum. A form from Chang Yang differs only in the nearly simple ♀ antenna, but may possibly be a small race of *albidior* Warr., in which case, according to the ♂ antenna, that is a quite different species from *deliaria* and from some of the forms which I have identified as *albidior*. The present species closely resembles *delphiaria* Guen., from India, in size, structure and in the under surface, but the much more rounded ocellus, not reaching the margins, the lack of silvery scales behind the median vein near the base of forewing and other slighter differences distinguish it.

maxima. **P. maxima** Th.-Mieg. Unknown to me in nature, but if it is really, as indicated, a ♀ with pectinate antenna, it is certainly a distinct species. If on the other hand there is a misprint, and ♀ should be read as ♂ (although as the sex is given twice in the description this is scarcely likely), or if the author only understands as "pectinations" the ciliated lamellae which characterize the ♀ antenna of the preceding species, it is just possible that *maxima* represents an extremely large form of the same. In any case it is desirable to introduce it here, for the sake of completeness. The description runs: "♀ 47 mm, antennae shortly pectinate. Wings white, forewing with a large round brown ocellus, 7 mm broad, its centre paler with a white lunule closing the cell. A little before, the ocellus bears a black mark, and there is another at the base of the 3. radial and 1. median. Some metallic scales in the middle of the ocellus. A pale yellow-brown spot at the middle of the inner margin and two internervular series at the distal margin, especially at the hinder angle. Hindwing with a yellow-brown cellular spot preceded by a lunule surrounded by metallic scales, its extremities directed towards the outer margin. Four pale yellowish brown lines or bands, more or less obsolete, formed partly of spots, partly of dots. The first traverses the cellular patch, the third is formed of internervular spots, the fourth is merely a fine line along the distal margin. Forewing beneath white, with the costa grey-brown, the central ocellus and two outer lines of the same colour. Hindwing beneath white, the lines not apparent. Face brown, vertex black, thorax and abdomen white, but the second half of the abdomen above, nearly to the anus, is dark grey. Japan, 1 ♀".

B. ♂ antenna dentate-ciliate (Problepsiodes Warr.).

superans. **P. superans** Btlr. (= *discophora* Fixs.) (5 a). The ocellated spot fully as round as in *ocellata* or even rounder, in some respects similar to that of *ocellata*, but without distinct dark outer ring and without the two

white wedge-spots between the radials, the white ground-colour only appearing as a narrow, elongate distal edging to the discocellulars. Differs further from *ocellata* and *eucircota* in the ♂ antenna, stouter palpus, more hairy pectus, white vertex of head and in the postmedian line having larger spots beyond it. Varies greatly in size. The summer brood (June—July) is usually very much larger than *ocellata*, but there is a small second brood in September only measuring on an average the same size as that species. Eastern Siberia, Korea and Japan.

P. phoebearia Ersch. (= *plagiata* Btl. = *deliaria* Brem. nec Guen.) (5 a) is very closely related to the *phoebearia*. preceding species, but has the brown median blotches much extended, the central one on the forewing joining the hindmargin and produced so far distally as to touch the weak postmedian line; the black transverse mark which is usually present in *superans* near the distal end of blotch is represented in *phoebearia* by a thick longitudinal mark on and behind the second radial; subterminal spots also enlarged, touching a smoky terminal suffusion. Abdomen dorsally darker. Amurland to Korea, also, though rare, in Japan.

11. Genus: **Antilycauges** gen. nov.

Face smooth. Palpus longish, rather stout, rough-scaled. Tongue developed. Antenna in ♂ with moderately long, shortly ciliated pectinations; in ♀ simple. Femora glabrous. Hindtibia in ♂ with one pair of spurs, in ♀ with two pairs. Forewing narrow, with costal and distal margins almost straight, the latter oblique; cell long, areole simple, large, subcostals normal. Hindwing rather narrow, costal margin rather long, distal margin rounded, cell more than one-half the length of wing, costal vein anastomosing with subcostal at a point or more, then gradually diverging, second subcostal rather shortly stalked with first radial.

Early stages unknown. The single species, *pinguis* Swinh., erroneously described as an *Emmiltis*, appears very distinct from any known species, and requires a separate genus. It may perhaps be related to the *impersonata* group of *Acidalia*, but the pectinate ♂ antenna, long cells, still stronger, rougher palpus, exceptional course of the costal vein of hindwing (though this latter is shared by the *lactea*-group) amply distinguish it. The stalking of the second subcostal of the hindwing is also extremely rare in *Acidalia*. Inhabits Eastern and Southern China and Formosa.

A. pinguis Swinh. (5 b). Dull brown-grey, irrorated with fuscous, with a paler, less irrorated band *pinguis*. proximally to the outer line; first line rather remote from base, somewhat sinuous, broadened into a narrow band, outer line rather thick, strongly sinuous, especially on forewing; a pale subterminal line, dark-shaded on both sides, but especially proximally; forewing with a black discal dot. Under surface almost without markings. Widely distributed throughout Eastern China; Tientsin, Shanghai and the Chusan Islands can be mentioned as Palearctic localities. June, July and September.

12. Genus: **Acidalia** Tr.

Palpus short, or very occasionally of moderate length, never long; clothed with appressed or moderately appressed scales. Antenna in ♂ ciliated, the cilia very occasionally arising from short pectinations. Hindtibia in ♂ without spurs or rarely with a single pair; in ♀ with 4 spurs. Forewing with areole simple. Hindwing variable in shape, the costal vein normal or diverging rather gradually, second subcostal not or (very rarely) very shortly stalked with first radial. ♂ genitalia: the two true genitalic segments (9. and 10. abdominal) enormously reduced, the pregenitalic (8. abdominal) bearing a pair of special organs, named "cerata" by BURROWS and PIERCE; these are prongs, frequent asymmetrical, arising laterally from a transverse band which bears the "mappa", a kind of apron which, in life, turns over and covers the base of the cerata. This structure, so far as yet tested, is very constant, and separates the genus sharply from *Ptychopoda*.

The eggs are oval, sometimes longer, sometimes shorter, longitudinally ridged and usually flattened more or less at one end or at both. They are very frequently laid, unlike the majority of Geometrids, in a nearly upright position. Notwithstanding some slight differences in colouring, they become, with remarkable uniformity, spotted or blotched with some shade of red a few days after oviposition. The larvae are exceedingly long and slender, and roll themselves into remarkable coils when disturbed. They are nearly cylindrical, without special protuberances, and much less strongly rugose than those of *Ptychopoda*, but usually with a somewhat rugose lateral ridge. In the temperate regions of both hemispheres they pass the winter in this stage, but several species are at least partially double-brooded, or perhaps even under favourable conditions triple-brooded. The pupa has the surface rather smooth and polished, of some shade of light brown; the cremaster,

in all the species which I can examine, is furnished with a pair of curved, diverging, moderately strong spines, a marked contrast to the 6 nearly equal, very fine and threadlike, hooked-tipped bristles of that of *Ptychopoda*.

The genus is an extremely extensive and extremely natural one, being found wherever the subfamily is represented, with the exception apparently of Chili, and showing exceedingly little structural variation, the chief differences being in the nature of the antennal ciliation and in the formation of the ♂ hindleg; the latter may be moderately long and comparatively slender, though even then extremely rarely provided with spurs and never with the middle spurs, or the tibia may be very much thickened, and in the latter case the tarsus may vary from nearly normal length to almost complete abortion. Even in colour and pattern the majority of the species show great uniformity and their discrimination is often a matter of no small difficulty.

The genus has been known by a number of different names — *Acidalia*, *Leptomeris*, *Craspedia*, *Emmiltis*, *Dosithea* and others. There can be hardly any doubt that SCHRANK's *Scopula*, which would be the oldest name, was really founded upon *ornata* Scop. and ought never to have been used in any other sense; but as in the present case historical usage has overridden strict logic, I have not thought it necessary to displace *Acidalia*, which is older than the various Hübnerian names sometimes substituted for it. Moreover, the *ornata*-group might possibly be constituted a separate genus according to the shape of the wing and a few other small characters, and if that view were taken the great residue would still stand as *Acidalia*. A few systematists have separated the species with a pair of spurs present on the ♂ hindtibia as a genus (*Pylarge* H.-Sch.). It is greatly to be wished that this were biologically tenable, as it is such a useful character; but it separates off from the rest a few species of such different facies that we are forced to the conclusion that the retention of the spurs in the evolutionary history of this genus has been casual only. Still, as it is so convenient taxonomically, I have retained *Pylarge* in a subgeneric or sectional sense. For the rest I have retained as nearly as possible the order of STAUDINGER's Catalog, which is in the hands of nearly every Palearctic Lepidopterist and which shows, on the whole, a very natural sequence. It has, however, been necessary to remove a few species of different structure (*Glossotrophia*) and to introduce *ochroleucata* H.-Sch., *remotata* Guen. and *aequifasciata* Chr., which were entirely misplaced by STAUDINGER.

A. Section *Pylarge* *). ♂ hindtibia with terminal spurs present.

As already stated, this section is in a sense arbitrary, merely indicating the least specialized forms in the genus. It embraces probably seven groups, if not more; *ternata* Schr., the type of *Pylarge*, being nearest the point of origin of such normal species of *Acidalia* as the *floslactata*-group; *ansulata* Led. and its allies more specialized in shape; a small group with stronger palpus, typified by *impersonata* Walk.; the narrow-winged species which have hitherto been called *Lycauges* Butl.; one or two species which are so similar in facies to the *marginepunctata*-group of *Acidalia* that they are evidently in almost the direct line of ancestry to them; two or three exceedingly smooth-scaled, glossy species typified by *gastonaria* Obth.; and a single, aberrant-looking species, *steganioides* Btlr., with better developed antennal pectinations and short cell of the forewing, which may prove to form a separate genus. Perhaps the simplest structural analysis reduces these groups to four, and this latter arrangement is here adopted.

impersonata-group.

♂ antenna with long, fasciculate ciliation; palpus stout and extending beyond frons; hindwing not greatly narrowed, second subcostal sometimes stalked.

cineraria.

A. *cineraria* Leech (3 k). Pale cinereous, irrorated with brown, and marked with brown lines. Except that the postmedian and subterminal lines should be somewhat more sinuous, incurved between the radials and the former here rather markedly dentate, our figure gives a very perfect idea of this neat little species. Some specimens are more weakly marked, the lines indistinct and the dark shade distally to the postmedian almost entirely absent, the discal spots are also occasionally reduced in size; but the variation is never so great as to render it difficult to recognize. On the underside the forewing is more brownish, the hindwing more whitish, both wings very weakly marked, the postmedian line the most noticeable. From the following species *cineraria* differs in the more arched costal margin of the forewing, rather larger size, less brownish ground-colour and less straight postmedian and subterminal lines. Only known from Korea and Japan, occurring in May and June.

A. *impersonata* is a rather variable species in colour, and very variable in the strength of the markings, and has received several names. I have so little material available for study that I am unable to decide how

*) See also *subtilata* Chr., which should be transferred here.

far the variation is geographical, how far seasonal and how far individual. A short series which I possess from Siccawei, near Shanghai, seems to point to its being in part seasonal, yet includes nothing so dark as the form *accurataria*. It is not impossible that the forms represent more than a single species, but I see no reason for thinking this probable, as they agree in all essential characters. All that is yet possible is to indicate the essential structure, and then to describe the named forms, leaving their exact status to be fixed hereafter. To the characters given above it need only be added that the wings are but little narrower than in the *ternata*-group, the distal margin of the forewing gently rounded, not very strongly oblique, that of the hindwing rounded, the costal margin slightly longer than the inner margin, but not nearly so strongly elongate as in the *lactea*-group. The second subcostal of the hindwing is decidedly variable, even in forms from a single locality; it may be either separate from the first radial, or rising from a common point or even longer-stalked than is found elsewhere in the genus. The ground-colour of both wings is usually bone-colour, sometimes more, sometimes less tinged with greyish, but with the colour variation produced chiefly by the degree of irroration with fuscous atoms, which may be very slight or extremely strong. The dark lines and black cell-spots are also very variable in the intensity of their expression; postmedian line usually more distinct than antemedian, nearly parallel with the distal margin but with slight or very slight curves inwards in the radial and submedian areas and usually accentuated by darker dots on the veins which, being placed rather at the distal side of the line, somewhat suggest minute teeth in it; antemedian, when distinctly traceable, is seen to be bent or angled in the cell, and is also sometimes marked with dark vein-dots, but is always wanting on the hindwing; median line or shade rather diffuse, almost straight, touching or nearly touching the cell-spot; distal area usually somewhat darkened, the pale subterminal line then distinct, very slightly sinuous, not dentate. Under surface with postmedian and subterminal markings and cell-spots mostly expressed, the basal area, especially of forewing, more suffused and without definite markings. — *impersonata* Walk. (3 k) is the lightest form, the ground-colour not tinged with grey, the fuscous irroration slight and not very dark, the transverse lines moderately distinct. WALKER's types were from China (Fu-chau, according to the register at the British Museum) and are in bad condition, but do not appear to differ appreciably from the forms occurring in Chekiang and in the neighbourhood of Shanghai and of Ichang, thus Palearctic. On the other hand two poor specimens from Ting-hai (Fokien) and Formosa appear to have been of a rather darker, more ochreous shade. On an average these light forms are rather small, and the dates, so far as available (Ichang, August; Shanghai district, September), suggest a second brood, especially as Dr. CULPIN took a larger, darker form at Shanghai at the end of April. Some of the localities given by LEECH are erroneous, being due to mistaken identification. I have, however, seen one Japanese example (Suma, 21 August, in coll. WILEMAN) referable here rather than to the form *macescens*. — *muscularia* Stgr. is a very similar but light grey form, founded on a single ♂ from Amurland. It is unknown to me, but is said to have the apex of forewing rather more acute than *accurataria*. Perhaps really a synonym of *impersonata*. A pair from Gensan, Korea, July, rather lighter than *macescens*, may possibly belong to it. — *macescens* Butl. (3 k) is of a medium, brownish grey, on an average larger than *impersonata*, the markings variable in distinctness. Japan, widely distributed, May to September; Shanghai in April; Chang Yang in June; Tientsin. — *accurataria* Chr. (3 k) is still darker, distinctly marked, the distal area particularly darkened, leaving a clearer space between median and postmedian lines. ♀ apparently smaller. Amurland, July and August.

A. gastonaria Ob. is very distinct in the very smooth, glossy scaling and pure white colouring, at least in a distal band. Moreover, if my *candicans* is really a form of this species, the structural characters are not quite identical; the palpus, though rather stronger and rougher-scaled than in typical *Acidalia*, seems somewhat intermediate and the tongue is long. I have not seen OBERTHÜR's form, from Oran. It is variable in colour, reddish brown or brownish, sometimes pale grey, the darker brown postmedian band as in our figured *candicans*, followed by a narrow white band (or thick line), the extreme distal edge also white, forewing with a row of minute dark dots between the veins. Abundant at Macta in April, hiding among scabious on the coast, in tolerably sheltered places. — *candicans* subsp. nov. (5 b) from Algiers and its immediate vicinity seems to be a good local race, or possibly a closely related species. All the examples which I have seen (both sexes) are rather smaller than typical *gastonaria* with both wings pure white from the base to the brown band and the grey shade between the two white distal lines much weaker; the fringes in the ♂ remain more or less brownish; discal dots perhaps less minute. Forewing beneath infuscated, except the white line beyond the band. The ♀ is still purer white, but has the band slightly darker, though a little narrowed, discal dots minute, underside scarcely so strongly infuscated. The neurulation varies a little; the 1. subcostal of forewing does not always anastomose; the 2. subcostal of hindwing is sometimes very shortly stalked, sometimes separate.

lactea-group.

♂ antenna with long fasciculate ciliation, sometimes arising from short pectinations; palpus short; hindwing greatly narrowed, second subcostal separate (*Lycauges* Btlr.).

lactea.

A. lactea Btlr. (3 g, ♂♀). Whitish ochreous, sometimes more tinged with fleshcolour; a more or less strong dusting of fine fuscous atoms. The ♂, as the figures show, is slightly less narrow-winged than the ♀ and more weakly marked, a reddish-brown or fuscous common oblique band which is present in the latter, and often very strongly expressed, being weak or almost entirely wanting in the former. In both sexes the discal dots are very distinct and black and there is an outer series of black dots, sometimes connected by a very fine line, its course slightly oblique and curved on the forewing, parallel with the distal margin on hindwing. In addition, the forewing often bears an indistinct inner line and the hindwing a second series of dots, or a dark shade, indicating the proximal shading of an obsolescent pale subterminal line. Under surface more weakly marked, the cell-spots remaining distinct. Common in Japan and some localities in N. E. China, and possibly has a much wider range, as it is by no means certain that it is any thing more than a form of the Indian *defamataria* Walk., which, however, seems to have the distal margin of the forewing slightly more oblique and that of the hindwing even straighter. HAMPTON has sunk *lactea* to *emissaria* Walk., which was described from a tinr ♀ from Moulmein and may possibly be a dwarfed form of the same species. This can only be decided when further material from Burma is available for study. There is probably a succession of broods throughout the summer; LEECH obtained it at Fu-chau and Ningpo in April, WILEMAN in Japan in August and again at the end of September. My friend Dr. M. CULPIN took it in the neighbourhood of Shanghai on the 13 August and again commonly from the 20 September. He obtained eggs on the last-mentioned date, and reared moths indoors about the middle of November. The larva, like those of most *Acidalia*, is extremely long and thin, not or scarcely rugose, the subsegmentation conspicuous, the subsegments very numerous; colour brownish, with darker dorsal band, spiracles dark and conspicuous. The moth is attracted by light.

donovani.

A. donovani Dist. (= *extraordinaria* Stgr. = *extremata* Warr.) (3 g, as *extraordinaria*) is also possibly nothing more than a very much larger form of *defamataria* Walk. Like typical *defamataria* from Ceylon, the wings are of a slightly more extreme shape than in *lactea*, and have a rather more strongly dark-dusted under surface. The sexes are apparently nearly alike, but I can only judge from two males; for some unexplained reason, the ♀ is the more generally taken. South Africa, Cameroons, Nigeria, Syria; may be expected also from some intervening localities. The dated specimens known to me were taken in August, November and December (S. Africa) and 27 April (S. Nigeria). I can find no appreciable difference between the African examples and the Syrian. On the latter STAUDINGER, apparently unacquainted with BUTLER's *Lycauges*, founded a new genus *Longula*. His publication of genus and species dates from the end of June 1892, DISTANT's description under the name of *donovani* from April of the same year.

andresi.

A. andresi Draudt, only recently described, is at present unknown to me, but the description is good and leaves no doubt that the species is referable to this section. The arrangement of the markings is compared with the *ochroleucata*-group, but the wings are much narrower with sharper apex. 16—17 mm. Hindwing not angled. Scaling dense and smooth. Yellow-grey, strongly dusted with black scales, towards the distal margin (especially on the hindwing) with a violet-reddish hue. Discal dot distinct on both wings. Forewing with three moderately oblique, distinctly dentate lines, which are slaty black in the ♀, more purplish or reddish in ♂. The dark shading of the subterminal is distinct, running to the apex, between the 3. radial and 2. median forming distally projecting spots, on the 2. submedian thickened into a large, conspicuous spot. Distal marginal line black, interrupted at the veins, here accompanied on each side (i. e. on the wing and the fringe) by black spots. Hindwing with the inner line wanting, otherwise similar. ♂ antenna with the joints projecting very strongly and with long, strong tufts of cilia. The types, a ♂ and a ♀, are in the collection of Herr ANDRES, Bacos, and were bred on the 14 October and 19 October from larvae found on *Conyza* at Cherbine, Lower Egypt. I know of no other examples. Larva not described.

steganioides-group.

Palpus short, smooth. ♂ antenna with slender, strongly ciliated pectinations. Cells rather short. Hindwing with second subcostal shortly stalked or nearly connate with first radial (gen. div.?).

steganioides.

A. steganioides Btlr. (4 m). Reddish grey, paler and less red from the base to the median line and in apical half of distal area. Forewing with costal edge narrowly darkened; first line angled outwards on the folds; median line almost straight, from middle of costal margin to middle of posterior margin, preceded by dark discal spot and followed by a slight dark shade; outer line sinuous and dentate, rather near the margin, especially between the third radial and second median, where it is followed by some dark suffusion; a dark terminal line; fringe long, its proximal half dark, enclosing pale spots opposite the veins. Hindwing without inner line and discal spot, the outer line indistinct, further from distal margin than on forewing. Underside paler, not or scarcely reddish, the markings weak, but both wings with distinct dark discal spot. Common in Japan,

also occurring in Korea; April and again in July. — ab. **unicolor** *ab. nov.* lacks the median line and is reddish *unicolor*, throughout, the discal spots and distal line not prominent.

ternata-group.

Palpus short. ♂ antenna with short or quite moderate ciliation. Hindwing with second subcostal not stalked.

A. ternata *Schrank* (= ? *graminaria* *Fisch.-Rössl.* = *fumata* *Steph.* = *commutata* *Frr.* = *saltuata* *ternata*. *Spr.* = *nitidaria* *Bdv.* = *gypsaria* *Bdv.*) (41). Whitish grey with a slight tinge of yellowish or brownish and with dense but fine blackish irroration. The transverse lines (on forewing 3, on hindwing 2) usually only slightly darker than the ground-colour, sometimes browner, sometimes greyer, the outer sometimes a little less indistinct than the others, occasionally even quite prominent. Hindwing with distal margin almost regularly rounded, only very slightly bent at the end of the third radial. Under surface of forewing more or less infuscated, of hindwing whiter. The ♀ is smaller than the ♂, usually rather more yellowish and better marked. — In ab. **simplaria** *Frr.* the lines are more distinct, being darker while the ground-colour is as a rule *simplaria*, less densely irrorated. Beneath the forewing is little or not infuscated. — **perfumata** *Reuter* is the name which *perfumata*, has been given to the darker, fuscous-grey specimens which inhabit parts of North Finland and Sweden, but in other circumpolar localities the form differs little from that of Central Europe and it is perhaps not truly a local race. — The species inhabits chiefly mountains or high-lying heathland and is one of the very few Acidaliids which extend into the Arctic regions. In Northern Europe it is of general distribution, in Central Europe more local; its most southerly locality is the Western Pyrenees, further eastward the Alps and Carpathians, then the Ural and Altai. It is said to occur also in Amurland and possibly Japan, but the specimens which I have seen from those countries are not true *ternata*. The egg is nearly cylindrical, both ends being somewhat flattened. It is usually laid on one end, with the micropyle at its apex. Finely ribbed longitudinally, with 17 or 18 ribs, the deep furrows crossed by 14 to 18 very much slighter ribs; the flattened micropylar end strongly pitted. When first laid it is of a pearly-yellow colour, but after a few days it becomes irregularly spotted or blotched with crimson. The larva is very slender and elongate, nearly cylindrical, with a dilated lateral skinfold, the segment-incisions not deep, but the subsegmentation well-marked, about 14—16 subsegments to a segment. The colour is light brown, with a dark dorsal stripe; spiracles black. It feeds on bilberry and probably on *Calluna*, *Erica*, etc., and hibernates nearly full grown or (according to MILLIÈRE) small. MILLIÈRE has figured but not described the pupa. The moth flies in June and July and is easily started up by day, but flies chiefly at dusk. It is usually plentiful where it occurs.

A. praecanata *Stgr.* (31) has the forewing rather more pointed than *ternata*, in this respect, as well as in *praecanata*, its colder grey colour, rather recalling *A. incanata* *L.* Further differs from *ternata* in the longer cilia of the ♂ antenna. The dark transverse lines are rather straight, the inner and median weak or wanting, the pale subterminal distinct. Underside of forewing infuscated, of hindwing whitish grey with blackish irroration; the postmedian line the most distinct. The ♀ is unknown to me. The species was discovered by RÜCKBEIL in the Koko Nor district in 1892—93.

A. ansulata differs from *ternata* in shape and markings, though agreeing pretty closely in structure. The forewing is narrower, its distal margin being more oblique and less convex; the hindwing is more irregularly shaped, the bend at the end of the third radial more pronounced, preceded by an excision (though sometimes in the ♂ very slight) between the first and the third radial. The lines are finer, well-defined and less regular, and discal spots are present on both wings, that of the forewing enlarged into a ring. — **ansulata** *Led.* from *ansulata*. Persia has the ground-colour rather strongly dusted with brown, the lines of the forewing all bent or angled near the costa, a brown shade midway between the outer line and the distal margin, the ring-spot on the forewing large. Under surface of forewing more strongly mixed with brown, of hindwing whiter, the forewing without the first line and with the cell-mark reduced to a normal dark spot. — **adulteraria** *Ersch.* (41) differs *adulteraria*, not only in being of an ochraceous or rosy colour and less dusted, but also in the absence of the submarginal band and in having the middle and outer lines of the forewing not or scarcely bent near the costa and the ring-spot much reduced in size. It may well be a separate species, but I have too little material before me on which to base an opinion, as *ansulata* is said to vary somewhat in the lines and spots. Western Turkestan from the Caspian Sea to Ferghana. — **characteristica** *Alph.* was regarded by CHRISTOPH as a synonym *characteristica*, of *adulteraria*, and agrees with it except in the ground-colour, which is pale like that of *ansulata*, only without the brown dusting. In some localities it flies with *adulteraria*, and might be regarded as an aberration, but in other places, according to STAUDINGER, it seems to form a local race. Zerafshan to the Ili district.

annubiata.

A. annubiata Stgr. (4l) is another very close ally of *ansulata*. The tail of the hindwing may perhaps be slightly weaker. The ground-colour is of a warm ochreous tone, the cell-spot of the forewing, both above and beneath, is weak or obsolescent, that of the hindwing sometimes wanting. The lines are nearly as in *adulteraria*, but there is no distinct black marginal line, such as occurs in the last-named form. STAUDINGER says that the colour is quite different, but both vary somewhat in this respect. The under surface lacks the inner line of the forewing, which even above is only weakly expressed. *annubiata* was described from Samarkand, where it was taken in June and July. STAUDINGER records that *characteristica* was found together with it. Occurs also in Transcaspia and elsewhere in Southern Siberia.

rubellata.

A. rubellata Rbr. (3l; 4h, as *beckeraria*). This name, difficult to determine from RAMBUR's poor figure, was previously cited with a query to *consanguinaria* Led. (*Ptychopoda*), but 5 or 6 years ago HOMBERG examined the type specimen and reported that it certainly belonged to *beckeraria* Led. By this we must of course understand the Iberian representative of *beckeraria*, which really differs structurally from it; and the further correction has been made by PÜNGELER. It rather closely resembles the Eastern species with which it has been confused. I have but few examples before me, and if it varies much it may be that the differences here noticed do not always hold. My specimens are of a rather more strongly ochreous tone, the lines less black, inclined to be thicker, only rarely marked with dark (scarcely black) dots on the veins; the discal dots also stand out rather less sharply; the pale subterminal line is rather well defined; the under surface without markings. The distal margin of the hindwing, at least in some specimens, appears rather less strongly convex than in *beckeraria*, but the difference is only slight. The egg is long-oval with strong longitudinal and weaker transverse ribs, whitish yellow at first, becoming blotched with pink. Larva tapering a little anteriorly, finely wrinkled, spiracles black; ventrally very faint uniform greenish, dorsally yellowish, especially the thoracic segments, with an irregular, ill-defined dark dorsal line and on the four central segments often some indistinct paired black marks. — Spain and Portugal, two or three broods in the summer.

cumulata.

A. cumulata Alph. (= *cretaria* Stgr.) (4h) has also, though with still less justification, been regarded as a form of *beckeraria*. It is considerably larger than that species and *rubellata*, the wings more elongate, the ♂ hindtibia more slender, the spurs much longer than in *rubellata*; hindtarsus long. Vertex of head white, collar darker than in the allies. The ground-colour is nearly the same as in *beckeraria*, varying, like that species, in the degree of the ochreous tinge; but in effect it is always greyer, on account of a denser dusting of grey scales. The antemedian and postmedian lines are more irregular in their course, the median shade very variable — strong, weak or absent. Between the postmedian and subterminal lines there is usually a band of strong grey shading and the subterminal shows the same expansions as in *marginipunctata*. Cell-spots rather large and black. The underside is weakly marked but usually shows the cell-spots and traces of the postmedian line, the distal grey shading and the pale subterminal. Inhabits Central Asia, from Transcaspia to the Ili district.

decolor.

A. decolor Stgr. (described as *Acidalina*, gen. nov.) is only known in the unique ♂ type, which I have not been able to examine; and as even the neuration is not indicated the generic position is somewhat doubtful. It appears to me not unlikely that its affinities may be with *A. flaccata* Stgr., but as it has a pair of spurs on the hindtibia it must be placed provisionally in the Section *Pylarge*. It is described as broad-winged, the distal margin of forewing nearly straight, that of hindwing with a slight bend in the middle; the antenna (♂) weakly serrate with rather long and strong pencils of cilia, the hindtibia somewhat longer than the femur and almost as long as the tarsus. The body and wings are of a uniform, washed-out bone-yellow, the fringes and the apical part of the forewing beneath more clay-yellow. Chellala, Algeria.

B. Section *Acidalia*. ♂ hindtibia with terminal spurs absent (in *flaccata* sometimes with a single spur present).

immorata.

A. immorata L. (= *contaminata* Scop. = *graminata* Hufn. = *fuscata* F.) (4g). This species and the following are so distinct in aspect from all others, that some of the older entomologists removed them widely from *Acidalia*, associating them with *Chiasmia* (= *Strenia*) *clathrata* L., which does not even belong to the same subfamily. The thick dark scaling, thickened and very irregular dark lines (the postmedian rather remote from the distal margin) and broadly darkened borders, containing the clear white, very irregular subterminal line, usually in part broken up into wedge-shaped spots, give them a very characteristic facies which to some extent justified the mistake. The structure and the early stages are nevertheless typically those of *Acidalia*, and the only irregularity other than that of the scheme of markings is found in the ♂ genitalia, which do not seem strictly homogeneous with those of the other species. *immorata* is so well known and so easily recognized that a detailed description is unnecessary. It occurs throughout a great part of Europe, though more local in

the West, and extends to Asia Minor, Siberia, etc. It frequents heaths and fields from May to August, in some localities partially double brooded, and is often found in company with the abundant *Ematurga atomaria* L., amongst which it might easily be overlooked. If not actually a day-flier, as some have asserted, it is at least so easily disturbed by day as to give the impression of being such. The egg has the form and sculpturing which is normal in the genus; shape somewhat irregular, nearly cylindrical or thickening at one end, very distinctly ribbed longitudinally, the ribs numbering about 20, and with about 20 finer transverse ribs. It is of a pale green colour when first laid, soon changing to straw-colour, the crimson blotches appearing in about 2 days. The larva is of the usual form, the elongate abdominal segments divided into about 20 subsegments; setae extremely minute; colour light yellowish brown or greyish brown, with fine, double, dark dorsal line, dark subdorsal line, each abdominal segment with a thickening of the dark marking anteriorly, a slender blackish supra-spiracular line. Feeds on *Erica*, *Calluna* and various other low plants. The pupa has the wing-cases and anterior part of dorsal surface much darkened, in this differing from the other species of the genus which I have examined. The moth varies moderately, but seldom produces really striking aberrations. The ♀ is smaller than the ♂ and perhaps on an average less tinged with brown and more strongly marked. Both sexes, however, may be either browner or greyer, while the dark lines may be well expressed or almost entirely obsolete. According to HORMUZAKI the variation is in part seasonal, spring specimens being on an average more strongly and broadly white banded than those of the later brood. Occasionally the first two lines of the forewing coalesce into a single very thick line or narrow band and when this is also more darkened than usual a rather striking appearance results. — ab. *serenata* Trti. is an unimportant aberration with all the pale parts of the wings broadened, the dark lines therefore narrowed; the third (postmedian) line is the darkest and thickest; subterminal line and pale parts of fringe rather conspicuously whitish. — ab. *albomarginata* Habich (3 k) is more striking, the white of the subterminal line being extended on both wings above and beneath to the distal margin, only intersected by dark lines along the veins. — *porosa* Krulik. is a small, dark second-brood form occurring in Eastern Russia, the whitish markings largely suppressed.

A. tessellaria Bdv. (4 g) is closely related to the preceding species, and is often erroneously regarded as a variety thereof. SPEYER very accurately pointed out the distinctions more than 40 years ago, and recently some other writers (as TURATI, SCHAWERDA) have protested against the union of the two. The distal margin of the hindwing is in *tessellaria* appreciably more crenulate, with a more noticeable excision (though still slight) between the radials. The nervures are all strongly dark-marked, the white parts of the wing almost entirely free from dark dusting, the dark lines usually more slender, more strongly dentate, the fringes more sharply chequered. As a rule also the white subterminal line is broader and still more irregularly broken, the spots between the radials in particular forming large, well separated wedges. The black discal spot of the hindwing is nearly always longer. On an average the size of *tessellaria* somewhat exceeds that of *immorata*. Local in Central and Southern Europe, Central Asia and Northern Amurland, flying in June and July. I have not seen the specimens from the Ala Tau Mountains which STAUDINGER gives as transitional. — ab. *meissli* Schawerda, from Herzegovina, is a handsome form of a uniform black colour except some small white submarginal spots, representing vestiges of the subterminal line. — *tabianaria* Trti. (3 k, misprinted *tabiascaria*) described as a separate species, is the Sicilian form, smaller and of a more yellowish tone than that of Eastern Europe and Asia Minor, with which its author compared it. The dark parts in particular are much less black, being rather of an olivaceous brown, and they are on an average narrower. As, however, a very similar form occurs also in France and Germany, and BOISDUVAL described the species from Northern Italy, it is doubtful whether the form *tabianaria* can be regarded as constant. Perhaps, even, it should be regarded as synonymous with the name-type and a varietal name be given to the fine, large, black-marked Eastern form, which I have before me from Croatia and Orenburg. At the same time it must be mentioned that BOISDUVAL called his type "nigro-fusca". Larva probably on *Medicago sativa*.

A. anaitaria Herz is unknown to me in nature, and as the essential points of structure are not given, and moreover it was founded on 3 ♀♀ only, it is possible that it does not even belong to this genus. The photographic figure, however, makes it appear that the second subcostal vein of the hindwing arises from the apex of the cell. The wings are said to be shaped nearly as in the genus *Anaitis*, but still more pointed, the costal margin of forewing strongly arched. White-grey with numerous scattered blackish scales and black central dots. Forewing with 4, hindwing with 3 brown-yellow transverse bands, of which the first two are the most strongly defined and broadest. A fine black marginal line. Under surface altogether similar, only the forewing without the first line. The markings somewhat recall those of the two preceding species. Wing-expanse 20 mm. Herr PÜNGELER (in litt.) has suggested that this is possibly the ♀ to the broad-winged *cajanderi* Herz which is described below. Mouth of the Viliui River, Lena district, Siberia, July.

A. rubiginata. Variable in colour, but easily distinguished, in all its known forms, from the species which most nearly resemble it in size, markings and structure on account of the bright, deep rufous or ochreous shades which always characterize it both above and beneath, and which are always wanting in the other allies. The antennal joints are not strongly thickened and the fascicles of cilia in the ♂ are slender and but little longer than the diameter of the shaft. The ♂ hindtibia is moderately thickened, with a hair-pencil, and with a fringe of hair-scales on the outer side, the tarsus not materially abbreviated, its length being almost or about equal to that of the tibia. The first line (present, as usual, on the forewing only) is strongly curved; the second is more gently curved near the costa of the forewing, is variable both in strength, thickness and degree of undulation, but usually distinct; the third is nearly parallel with the distal margin and is not or only very feebly denticulate; the space between these two lines is nearly always a little lighter or clearer than the rest of the wing; the distal area is usually more or less darkened, at least sufficiently to render the pale subterminal line well visible; the discal spots are minute, that of the forewing usually obsolete. Under surface similar, the forewing without first line, but with a more distinct discal dot. The eggs are usually laid in heaps and in an upright position and are somewhat cylindrical, but broader at the micropylar end; they are very distinctly ribbed longitudinally, the ribs numbering about 16, and much more finely ribbed transversely; the micropylar end is strongly rounded, the micropyle very distinctly stellate in form. When first laid the egg is bright green, but in a few hours it changes to greenish-yellow with purple longitudinal lines. The larva is slender, slightly thicker posteriorly and tapering regularly, the head notched, the skin rough; the colour is some shade of grey, with a fine dark dorsal line of somewhat variable thickness, at times widening out in the middles of the middle segments. It has been found on thyme, heath and other plants, but is more often obtained by breeding from the egg. The moth is double brooded, appearing in May and June and again in August or even September. It usually frequents dry rough fields or heaths, hiding during the herbage by day, but often becoming more active in the afternoon. At night it is strongly attracted by light. — **rubiginata** *Hufn.* (= *rubricata* *Schiff.* = *vittata* *Thnb.* = *domialla* *Geoff.* = *variata* *Vill.*) (4 h) is the ordinary European form, characterized by the purple-red or red-brown colouring, which is generally very bright in freshly bred specimens, but is liable to fade. The variation, apart from the shade of colour, consists chiefly in the strength and sometimes the position of the median line; this is usually nearer to the outer line than to the inner, but sometimes central. Sometimes the entire wings, excepting the space between the median and postmedian lines, are strongly irrorated with dark scales. Second-brood specimens seem to be on the whole smaller and darker. Europe (except the Arctic Region) to Armenia, also in the Altai, Tarbagatai and Ala Tau Mountains. — **ochraceata** *Stgr.* is an ochreous, not reddish form which prevails in S.E. Russia, Transcaucasia and the Taurus, but occasionally appears also with the type form as a more aberration. **halimodrendrata** *Ersch.* (= *halimodendronata* *Fuchs*) (4 h), which is also more ochreous than the type form, is distinguished further by its somewhat larger size and by having a tinge of reddish; in ERSCHOFF's figure, the first line on the hindwing precedes the discal spot. Represents *rubiginata* in Western Turkestan, from the Caspian Sea to Issyk-Kul.

A. turbidaria *Hbn.* (= *macraria* *Guen.* = *lutosata* *Rbr.*) (4 h) is closely related to *rubiginata* but differs in its duller colour (pale greyish ochreous, more or less densely dusted with fuscous), in having the black discal spots more sharply expressed and in other slight characters. The nature of the antennal ciliations shows no tangible differences and the structure of the hindleg is similar in the two species. HÜBNER's figure, the type of the name, is scarcely recognizable, and either represents a rare aberration or possibly a distinct species. But until specimens are met with similar to this figure, HERRICH-SCHÄFFER's determination should be accepted, and it is neither necessary nor desirable to provide even a varietal name for the ordinary form. Distributed in Southern Europe and from Asia Minor to Persia. My specimens, from Turkey, are all very heavily dusted with fuscous, forming a striking contrast to the following race. Should it prove that this dark form also is localized, it will require a distinctive name. — **turbulentaria** *Stgr.* (= *collata* *Warr.*) is a much lighter form, the fuscous dusting so greatly reduced that the colour closely resembles that of the two following. Usually, however, some of the dark dusting remains in the distal area, particularly between the postmedian line and the pale subterminal, which latter is thereby rendered distinct. The forewing beneath also generally remains more or less infuscated. Recorded from most parts of Europe which lie south of about 40° N. lat. and also from Syria. According to STAUDINGER it possibly represents a summer form of *turbidaria*. — **ab. habenata** *Warr.* is simply an extreme development in which the dark dusting which usually remains in *turbulentaria* has almost entirely disappeared.

A. manifesta *Prout* (5 g). Similar to *turbidaria turbulentaria* but recognizable at once by the much larger, very striking black discal dots, as well as by the more oblique central band. Rather clear pale straw-colour, with slight, sparse, minute dark speckles only visible with the lens. Markings grey, variable in distinctness, but usually rather weak. First line of forewing about as in the two preceding species. Median shade rather thick, but sometimes faint; rather obliquely placed, on the forewing usually passing close to or touching the central spot distally, on the hindwing proximal to it, sometimes touching, sometimes further removed.

Outer line nearly as in the preceding species, not (as is usually but not invariably the case in that) incurved between the radials; the succeeding dark band rather irregular, often almost interrupted between the radials, sometimes obsolescent throughout. The under surface is weakly marked, the forewing, or at least its basal part, generally somewhat infuscated. Tientsin, June and again in August-September. I see no indication at all of seasonal variation. The ♂ hindtibia possesses the usual rather strong hair-pencil; the tarsus is two-thirds as long as the tibia, thus much less abbreviated than in *corrivalaria*, with which species I originally compared it. By the leg structure, rounded hindwing, etc., the present is its more correct position.

A. ochroleucata *H.-Sch.* (? = *colonaria* *H.-Sch.*) (5 g) is a very inconspicuous species, and as it is also tolerably variable and closely resembles some others, its determination is occasionally a matter of some difficulty and uncertainty. Indeed it is not yet positively known whether it may not be the same species as *minorata* *Bdv.* from South and East Africa or *remotata* *Guen.*, which again may be a synonym of *minorata*. In any case the species which we figure and which, though formerly considered rare, has now found its way into most of the larger collections, is certainly the true *ochroleucata* *H.-Sch.* Pale straw-colour, finely and rather sparsely dusted with fuscous, the dusting sometimes (as *HERRICH-SCHÄFFER* gives it) more copious on the fringes. The lines are lighter fuscous, varying in distinctness, the first on the forewing usually rather weak, more or less obsolescent costally; when distinctly enough expressed this line is seen to be rectangularly bent in the cell. The median line is not as a rule thickened; it runs on the forewing nearly parallel with the distal margin, or more commonly is incurved somewhat in its posterior half, on the hindwing passing just proximally to the cell-spot, usually making a curve round it. The postmedian line is dentate and is somewhat incurved between the radials and in the submedian area. The pale subterminal line is usually indistinct, being margined by very little dark shading. Cell-spots black, that of the hindwing generally somewhat the larger. Underside more whitish, especially the hindwing and posterior part of forewing; cell-spots and postmedian line usually distinct, the other markings weak or wanting. Differs from both the preceding species in the strongly dentate postmedian line, and usually in its somewhat smaller size and the absence of a noticeable dark shade or band distally to this; from *turbidaria* and (though much more slightly) from *manifesta*, it also differs in the structure of the ♂ hindleg, the tarsus being about three-fifths as long as the tibia. The antenna in the ♂ bears rather long fascicles of cilia; *HERRICH-SCHÄFFER* describes than as "very long" in erecting his *colonaria*, which is probably a synonym, or more greyish aberration, of this species. His otherwise rather superficial description compares it with *humiliata* *Hufn.* and *straminata* *Tr.*, which both belong to *Ptychopoda*. *ochroleucata* inhabits Southern Europe from Spain to Crete, also Cyprus and Egypt. I have seen it from several localities not enumerated by *STAUDINGER* (Calabria, Capri, Corfu, Crete) and suspect it is a good deal overlooked. — *corcularia* *Rbl.* *corcularia*. from the Canaries is only a slightly smaller and darker form of *ochroleucata* and is treated by *STAUDINGER* as quite synonymous with the type. This may probably prove to be correct, as *BOHATSCH* has recorded the same form as occurring among the type not uncommonly in Murcia. I have seen insufficient material to justify a definite opinion. *ochroleucata* seems to be double-brooded if not triple-brooded; it appears in April-May, July-August and even in September and October. The variation in size and markings does not seem to be seasonal or sexual.

A. inustata *H.-Sch.* is unknown to me. Its author hesitated as to whether it might not prove to be *inustata*, a form of *ochroleucata*. *BOHATSCH* regarded it as such. *STAUDINGER*, however, says that it is certainly not a variety of *ochroleucata*. It was founded on a single ♀ in bad condition, of a reddish straw-colour, somewhat narrower-winged than the preceding species, the dark dusting denser, particularly in the apical part of the costal margin of the forewing and on the fringes. *BOHATSCH* asserts that the blackened apex is not natural, but due to the action of mercury, which was formerly used as a preservative against insects and other pests. Recorded from Central Italy. *HERRICH-SCHÄFFER* adds that "Herr MANN took the species at Baden near Vienna", but this is probably an error.

A. remotata *Guen.* I have not been able to identify this species certainly from *GUENÉE*'s description, *remotata*, but recent investigations have led me to doubt whether the species which we have figured under this name (4e, probably a form of *ignobilis*) can be the true *remotata*. *OBERTHÜR* identifies *GUENÉE*'s type (supposed to come from N. India) with an Algerian form which I have unfortunately not seen, and at the same time with a Natal species, which would undoubtedly be the widely-distributed African *minorata* *Bdv.* As *STAUDINGER* regards *remotata* as probably a Darwinian form of *ochroleucata*, and *OBERTHÜR* mentions no difference except that the common transverse line beneath (postmedian) runs more parallel to the distal margin, the identification with *minorata* seems probable enough, for the latter is so close to *ochroleucata* that I have hitherto discovered no constant distinction, though its colour seems less yellowish. It is strange, however, that I have not seen this species from India. *HAMPSON* and *LEECH* confused various forms and allies, chiefly larger, under the name of *remotata*. Its nearest Indian representative, so far as I know, is really *actuaria* *Walk.*, recently

sunk by FLETCHER to *minorata*, but with shorter hindtarsus. GUENÉE describes *remotata* as expanding 18 mm, 1 mm less than *ochroleucata*, rather more greyish, the postmedian line little sinuate, wavy, remote from the inner line and even from the median, which on the forewing passes much above (i. e., proximally to) the discal spot without curving. ♂ hindtarsus "nearly as long" as tibia, but this is said also of *ochroleucata*.

personata.

A. personata *sp. nov.* (= *impersonata* Pryer nec Walk.) (7 a). Bone-colour, sparsely dusted with blackish atoms. Forewing with 3, hindwing with 2 fine browner (sometimes greyish) lines and sometimes some weak distal dusting defining on both sides a vague, wavy subterminal line, which is otherwise invisible; discal and marginal dots sharp, black. Forewing with first line oblique outwards from costal margin, strongly bent in cell, thence parallel with distal margin, rarely distinct; median shade somewhat thicker, distal to cell-dot, undulate or subdentate, incurved in submedian area, somewhat weak; postmedian fine, distinct, denticulate, almost parallel with distal margin or very slightly incurved between the radials. Hindwing with the median shade proximal to the cell-dot, incurved in cell and in submedian area, post-median more sinuous than on forewing, showing the two inward curves. Under surface of hindwing and of posterior part of forewing white, almost unmarked, the hindwing usually showing a very faint postmedian line; forewing anteriorly, on the other hand, rather darker than above, postmedian line distinct; both wings with sharp cell-dot and marginal dots. ♂ antennal ciliation considerably longer than the width of the shaft, apparently nearly twice as long; hindtibia not greatly thickened, fringed with hair-scales above, tarsus almost as long as tibia. Described from 9 ♂♂, 8 being in the British Museum. Type from Satsuma, May 1886 (LEECH collection); 2 from Gensan, July and August 1887, 1 Nikko 1887, 1 Nagasaki, May 1886 (all LEECH collection); Japan, probably Yokohama (H. PRYER; misidentified as *impersonata* Walk.); Yokohama (2 worn examples from the JONAS collection); Kobe, Japan, May 1910 (in my collection, presented by Dr. M. CULPIN). The last-named example is rather strongly grey-dusted, rather weakly marked, especially as regards the discal dot of the forewing, but in general *personata* varies little except in size (18—21 mm, English measuring). Extremely like certain forms of *ochroleucata* H.-Sch. and *actuaria* Walk., scarcely distinguishable except in the longer hind-tarsus and perhaps slightly longer antennal ciliation. May be regarded as the Eastern representative of the group. In comparison, *ochroleucata* shows a slightly more fleshy tinge, slightly more incurved postmedian line, stronger subterminal shades and better marked underside. The resemblance to pale *impersonata* is more superficial. Some worn examples from Ichang are probably small *personata*.

adelpharia.

A. adelpharia Püng. (3 k, as *adelphata*) differs from *ochroleucata* in its rather brighter colour, sparser and minuter dusting and darker ochreous (not fuscous or grey) lines. Median line curved costally, closely following or even touching the discal dot; postmedian excurved near costal margin, very gently incurved between radials and then still more sinuous to the posterior margin, not at all denticulate; the pale postmedian is discernible between two faint dark shades. Discal spots black, but minute; marginal dots very minute, in part obsolescent. Under surface altogether without markings except for very minute and not very strong discal spot on each wing. The underside affords a very ready distinction from ordinary *ochroleucata*, but BOHATSCH records pale aberrations of that species with unmarked underside. Finally, the hindtarsus of *adelpharia* is relatively shorter, being less than one-half the length of the tibia. The ♂ antennal ciliation is short, scarcely half as long as in *turbidaria*. Jericho and Lower Egypt. The type specimens, from Jericho, were bred on 20 June and 2 July 1892 from ova laid by a ♀ which was captured on 23 March. The larva when full grown measured about 20 mm, slender in proportion, nearly cylindrical posteriorly very little thicker, the head slightly notched. The dorsal area is pale yellowish brown, somewhat mixed with green, the ventral light grey. Similar to the larva of *A. rubiginata*, but somewhat more compact, the spiracles less prominent. The pupa is light brown with darker stigmata, otherwise markingless. The further locality, Lower Egypt, was communicated by Herr PÜNGLER (in litt.), who has recently received it from thence for determination.

sybillaria.

A. sybillaria Swinh. (7 b) is of about the size and colour of *ochroleucata*, very finely but moderately strongly sprinkled with blackish. Lines rather weak, the median on forewing somewhat thickened, more strongly incurved behind the cell and somewhat dentate distally, the postmedian further from the distal margin, more sinuous, angled on the first radial, then markedly incurved; distal area appreciably darkened, containing a distinct rather broad pale subterminal line, formed much as in *Ptychopoda biselata*, to weakly marked forms of which the species bears some superficial resemblance, except in its rather smaller size. Each wing with a black discal dot and black interneural dots or very short streaks at the distal margin. Beneath the hindwing is whiter; both wings bear the cell-spots, postmedian line and the markings distally thereto. Ichang, taken in August by Mr. Pratt. The leg and antennal structure are nearly as in *ochroleucata*.

ignobilis.

A. ignobilis Warr. (4 m, fig. 5; 5 b) is considerably larger, exceeding in average size the well-known *immutata*. Colour again similar to that of the preceding group, rather clear, the black dusting being as sparse

as in *corrivalaria*, from which its coloration does not materially differ. Discal spots black, lines brownish ochreous; first bent in cell, middle line or shade rather thick, curved well beyond discal spot, then somewhat oblique inwards, that of hindwing passing just proximally to the discal spot, usually a little bent round the spot as in *ochroleucata*, postmedian line lunulate-dentate, with slight sinus inwards between the radials and again in submedian area; distal shading and subterminal line very weak, distal margin with black dots between the veins, though sometimes very minute. Under surface somewhat paler, especially of hindwing; discal and usually also marginal dots present, forewing with median shade and both wings with postmedian line. Antennal ciliation in the ♂ about equal to width of shaft, hindtibia strongly thickened, with strong hair-tuft, rather pure white, tarsus scarcely half the length of the tibia. Distributed in Japan, June and July. ♀♀ from Ichang, Chang Yang, and Chia-ting-fu also probably belong to this species as slightly different forms, but in this difficult group I do not venture to decide definitely without the ♂. The distal margin of the hindwing is just appreciably bent at the third radial, and one or two specimens apparently referable here have this character a little exaggerated, thus forming rather perplexing transitions towards the eastern forms of *nigropunctata*. — *humilis* subsp. nov. looks slightly more slenderly built and smoother-scaled, the distal margin of forewing slightly straighter, of hindwing more rounded, the median and postmedian lines rather more sharply dentate, the former sometimes little thickened. Under surface of both wings whitish, only the forewing weakly suffused with reddish grey from the base to the median line and from the costal margin to behind the cell; the postmedian line weak or almost absent on the hindwing. The ♂ hindtarsus appears to be shorter in proportion than in *ignobilis* and it is by no means unlikely we are dealing with a separate species. Dharmasala, a short series of both sexes in the British Museum collection, erroneously recorded by BUTLER as *Idaea strigilata* Schiff. and one of them, a worn ♀, as *Anisodes similaria* Walk. A pair from Sultanpur, Kulu, seem to be only a slight subvariety or aberration of *humilis*.

A. delitata sp. nov. (7b) Similar to *ignobilis*, but almost entirely without any yellowish tinge, the colour being pale, glossy, whitish grey, the markings very weak. In these respects and in having the forewing slightly narrower and the hindwing inappreciably bent at the third radial, bears a slight superficial resemblance to the pale forms of *Ptychopoda inornata* Haw. The lines follow approximately the same course as in *ignobilis*, but the postmedian is less dentate and less bent. The discal spots are very small but black, the black marginal dots minute. Fringes slightly more inclining towards yellowish, only their basal part dusted with grey. Forewing beneath suffused with shining reddish grey, lines and cell-spot weak, the median line appearing somewhat straighter than in *ignobilis*. Hindwing beneath whitish, the discal dot distinct, postmedian line very faint or almost obsolete. Antennal joints a little projecting, the fascicles of cilia rather stronger than in *ignobilis*. Hindtarsus about half the length of tibia. Face and vertex respectively black and white, as in the allied forms, but the latter bounded posteriorly by a rather broader black line or bar than usual; collar brown. Chowpin-sa, Western China, occurring in May—June. Described from 3 ♂♂, all formerly in the LEECH collection, the type and another now in the British Museum, the third in the PÜNGELER collection. Possibly really nearer to *bifalsaria*, which has nearly the same size, shape and colour, but is very slightly broader-winged, slightly greyer, the discal spot of the forewing not black, a band distally to the postmedian and several other slight differences, and the hindtarsus of the ♂ rather more than half the length of the tibia.

A. butyroza Warr. (7b) may be easily recognized by its bright shining straw-yellow colour, with the markings only slightly darker. Forewing with first line weakly curved, cell-spot rather large, but indistinct, median line excurved beyond cell, gently incurved posteriorly, postmedian sinuous and somewhat dentate, the pale subterminal scarcely defined. Hindwing similar, without first line; cell-spot small. Underside of forewing duller, of hindwing paler, both very weakly marked, the hindwing sometimes without markings. Hindtibia of ♂ strongly thickened, tarsus short. Discovered at Sikkim, but reaches Dharmasala.

A. arenosaria Stgr. (3 k). This and the three following species are also yellow, but of an entirely different shade than that of *butyroza*, less glossy and inclining more to light sulphur-yellow. The distal margin of the hindwing is also less strongly convex than in *butyroza* and the species which precede it; indeed it is in general rather straight from the anal angle to the middle or beyond. *arenosaria* is distinguished by the whitish, unmarked hindwing, while the forewing also is pale and weakly marked, the only conspicuous marking being the moderately thick ochreous-brown line beyond the middle, though a minute cell-spot and a pair of fine submarginal lines are also traceable. Forewing beneath nearly as white as hindwing and almost without markings. ♂ antennal ciliation moderate, hindtibia rather short, tarsus about equal in length to tibia. Only known from S. E. Russia.

A. albiceraria is closely related to the preceding species, perhaps slightly narrower-winged; in the only specimen which I have been able to examine the first subcostal vein of the forewing arises before the end of

the areole, but it is doubtful whether this would prove constant. Forewing usually with all 5 lines present, somewhat ferruginous-tinted, the first sharply angled in the cell, the second (corresponding to the principal line of *arenosaria*) somewhat the strongest and well beyond the middle, the last three (postmedian and two subterminals) near together; cell-spot present. Hindwing paler and more weakly marked, but not devoid of markings like *arenosaria*. Margin of both wings with dark dashes between the veins. Under surface of both

albiceraria. wings very pale yellowish, with median and postmedian lines present. — *albiceraria* *H.-Sch.* (= *sulphuraria infuscata* *Frr.*) is the smaller and less distinctly marked form and inhabits S. E. Russia and Transcaucasia. — *ab. infuscata* I will take drawing from *H.-Sch. ab. nov.* (= *ochroleucaria* *H.-Sch.* fig. 469, 470, nom. *praeocc.*)

vitellinaria. (7a) is a form with almost the whole of the forewing much darker, suffused with fuscous. — *vitellinaria* *Ev.* represents *albiceraria* in Persia and Siberia, extending in the latter country from the Altai to the extreme east (Amurland, etc.). It is larger and more sharply marked, the discal spots of both wings strong and black.

immistaria. **A. immistaria** *H.-Sch.* (4 h) is somewhat ampler-winged than the two preceding and of a lighter sulphur-yellow (our figure does not represent one of the brightest forms). It is at once distinguished from them by the two *fine, wavy* brown lines, darker punctuated on the veins. Discal and terminal spots black, not extended into dashes. Subterminal shades faintly indicated. Under surface with thick postmedian line, the base of the forewing suffused more or less with brown. The ♂ antenna is furnished with moderately strong fascicles of cilia, the hindtarsus at least as long as the tibia. Taurus to Transcaucasia and Persia.

latelineata. **A. latelineata** *Graes.* (= *divisaria* *Chr.*) (7b) is another conspicuous species. Larger than *arenosaria*, which it nearly resembles in the markings of the forewing. Ground-colour of forewing rather deeper and more ochreous, the brown postmedian line thick and strong, the outer of the two subterminals stronger than the inner. Hindwing paler, but with the markings of the forewing reproduced. Cell-spot almost or entirely wanting on both wings. Under surface similarly marked, the basal area, at least of forewing, usually with some brown suffusion. The ♀ is rather smaller than the ♂, and with slightly narrower wings, but otherwise similar. Apparently local, recorded from the Southern Ural, West of Issyk-Kul and from the Ili district. A specimen before me is from the Alexander Mountains.

beckeraria. **A. beckeraria** *Led.* (7b) Pale greyish ochreous with sparse grey dusting, the lines grey, little darker than the ground-colour, but the antemedian and postmedian marked with black spots on the veins; antemedian bent in cell, wanting on hindwing; median shade sinuous, not very thick, on forewing following, on hindwing preceding the sharply black discal dot; postmedian lunulate-dentate, the teeth accentuated by the black vein-dots, somewhat oblique outwards from costal margin of forewing, a little incurved between the radials; dark distal shading and pale subterminal line very weak; distal margin with black dots or short dashes between the veins. Underside paler, weakly marked. Vertex of head also paler, collar brown. ♂ antennal ciliation regular, not very long. The specimens which I have seen, from Sarepta in some numbers and one or two from Syria and from Quetta, show comparatively little variation and Herr PÜNGELER writes me that the form which has recently been taken in numbers in Central Italy also only differs in being of a rather more whitish tone. When STAUDINGER (*Iris*, vol. 5, p. 154) speaks of it as a strongly variable species, I suspect that this is chiefly due to his having confounded several species under the one name. That this is at least partly the case, has been shown above, under *rubellata* and *cumulata*. The range of variation in true *beckeraria* is chiefly in the strength of the markings, both on the upper and under surfaces; in particular the central shade, which is usually rather indistinct, sometimes forms on both wings above a quite strong dark central band, the dark shading proximally to the pale subterminal line also being subject to some intensification. It may be that in some of the Asiatic localities from which I have seen no material, more striking aberrations or local races do really occur. ALPHÉRAKY records two handsome greyish, strongly marked specimens from Kuldja, where, however, most of the examples are quite typical. A pair from Quetta (a hitherto unrecorded locality) collected by NURSE in June 1902 and 1903 and now in the British Museum, are also normal in all respects. The species has a wide area of distribution, extending locally from Italy through Southern Europe, Asia Minor and Syria to Central Asia and N. W. India, and including S. E. Russia, the locality from which it was first known. Also once in Shan-Si, Central China. It is said to occur in June and July, but at least in the Kuldja district there are two generations, April and August. — *assimilaria* *Stgr.*, likely a distinct species, is said to differ in possessing only the two lines, placed at equal distances from the central spot, the outer not sharply dentate, and in the distal area a strong, complete dark band, much further from the outer line than in the allied forms; on the hindwing the central spot is placed proximally instead of distally to the inner line. Described from a single ♀ from Ferghana.

rebeli. **A. rebeli** *nom. nov.* (= *agraria* *Rbl.* nec *Joan.*) is extremely like a small, whitish form of *beckeraria*, to which, indeed, it was referred by STAUDINGER, but is distinguished by having the vertex snow-white and the

palpus in both sexes shorter. The inner line is obsolete, the outer present but weak, especially in the ♀. The collar is brown, as in *beckeraria*, not blackish as in *marginepunctata*. Under surface whitish, unmarked, only the forewing towards the distal margin tinged with brownish. The ♀ is smaller and broader-winged than the ♂. Istria and Dalmatia. But for the assertion of so eminent a lepidopterist as Dr. REBEL regarding the palpus, I should have supposed that this species (which I have not seen) was a form of *beckeraria*; in the palest Sarepta *beckeraria* the vertex is almost white, though not snow-white.

A. guancharia Alph. (4 h) is easily distinguished from all the similarly marked species by its peculiar *guancharia*. coloration. The ground-colour, though slightly variable, is always of a dull grey or reddish grey, strongly and coarsely dusted with fuscous. The distal margin of the hindwing is more crenulate than in the related species. The ♂ has the antennal fascicles of cilia long, the hindleg rather long and slender, though spurless. The markings are sufficiently shown by our figure. The pale subterminal line of the forewing varies in distinctness, but usually shows something of the thickening between the radials which is characteristic of, though not entirely confined to, the *marginepunctata*-group. Only known from the Canary Islands, where it occurs in March and April and again in July and August. The earlier stages are not known.

A. marginepunctata Goeze (= *conjugata* Bkh. = *immutaria* Hbn. = *incanata* Haw. = *contiguata* *marginepunctata*. Haw. = ? *aniculosata* Rbr. = *puellaria* Bdv. = *promutata* Guen.) (4 h). Whitish grey with a slight or rather stronger tinge of ochreous, and usually with numerous scattered dark atoms over the entire surface. The lines nearly always commencing from dark costal spots and usually strengthened with spots on the veins; all are bent near the costal margin and incurved behind the cell, the postmedian dentate, the teeth accentuated by the dark vein-spots, which are often prolonged into very short dashes; the postmedian is also moderately incurved between the radials. Cell-spots and terminal dots always strongly black. Under surface more glossy, much more weakly marked, often almost without markings; the forewing greyish or brownish, the hindwing whiter. Exceedingly variable; a few of the extreme aberrations deserve separate names. Our figure represents a normal form, with the median shade well developed and some dark shading distally to the postmedian. The collar is always black, the abdomen more or less banded with darker and lighter. Hindtibia only moderately thickened, tarsus little shorter than tibia. The egg is laid flat or nearly upright, long oval, flattened at micropylar end; strongly ribbed, the longitudinal ribs the stronger, both equal on the flat end; pale straw-colour when first laid, afterwards to the naked eye red, formed by large dense blotches on a pale ground. Larva very long and slender, nearly cylindrical, scarcely tapering anteriorly, segmentation well marked. Pale slaty grey, with a dull olive mediodorsal stripe divided by a very fine pale central line; spiracles black. Feeds on narrow-leaved plantain, Achillea, Caryophyllaceae and other plants. Pupa smooth and polished, pale brown, the head and anal extremity darker, the wing-cases tinged with green. The moth is double brooded and rests by day on rocks and walls, flying at dusk or later and sometimes visiting flowers or artificial sweets. The colouring certainly varies according to that of the rocks, but not so definitely as to form very well-marked local races. Central and Southern Europe to Central Asia, often common. Very small forms are frequent in S. Europe and Transcaucasia. — ab. **pastoraria** Joan. (= *madoniata* F. Fuchs), described from Caesarea, is a small whitish *pastoraria*. form of rather general occurrence in most Southern localities (perhaps even forming a local race in some places), the usual markings all present, but the lines and submarginal shades rather ill defined. FUCHS regards it as a local race in Sicily. All the four specimens which I have seen from Lagodechi, Transcaucasia (June, July, August) belong here. — ab. **mundata** ab. nov. is a very pretty form occurring occasionally on the chalk downs *mundata*. of Southern England and corresponding to the ab. *mundata* of *Hyposcotis obscurata* Schiff., entirely without dark speckling, only the dark lines remaining and therefore standing out very clearly. — ab. **orphnaeata** *orphnaeata*. F. Fuchs represents the opposite extreme of variation, the wings being blackish all over, though with the black lines and pale subterminal still traceable. Described from the Taunus district. A very extreme example from North Cornwall was figured by me in "The Entomologist", vol 42, p. 1. As in most melanic forms of whitish species, the fringes remain pale.

A. permutata Stgr. (3 l) is similar to the preceding, but easily distinguished by its ochreous brown *permutata*. ground-colour, by having the postmedian line of both wings more deeply inbent between the radials and again posteriorly, and followed by a more distinct dark grey band, occupying most of the space between the postmedian and the strongly lunulate subterminal, though sometimes weakened between the radials. Collar black. The broad dark belts of the abdomen blacker than in any but the melanic forms of *marginepunctata*. Only known from the Uliassutai district. — **gnophosaria** Leech (5 d) of which the type ♂ from How-Kow, Tibet, *gnophosaria*. remains unique, will almost certainly prove to be a much larger, darker form of *permutata*. Unless the wings be relatively slightly more elongate, I can find no differences but those of size and coloration. The forewing is of a slightly duller brown, its entire distal area and the whole of the hindwing rather strongly infuscated. Taken at an elevation of 3000 m in July or August. From *cumulata* Alph., which *gnophosaria* also somewhat

recalls in size and shape, the characters here given will also differentiate it, not to mention the structure of the ♂ hindtibia.

luridata.

A. luridata Z. (= *coenosaria* Led.) (4 e). By some very unfortunate confusion, the correct identification of the name of *luridata* was lost almost immediately after its erection, and in 1855 LEDERER renamed the same species *coenosaria*, by which name it has since been known. And to make matters worse, the name of *luridata* Z. has been assumed to apply to a species belonging in our genus *Glossotrophia* and closely allied to *confinnaria* H.-Sch. ZELLER's type of *luridata*, a unique ♀ from Rhodes, is still extant in the British Museum collection, and is quite certainly a form of *coenosaria*, only with the dusting and markings all fuscous instead of reddish, giving it a rougher aspect. Apart from all other proofs of the identity, the presence of 4 spurs on the hindtibia and the normal tongue prove that it is not a *Glossotrophia*. Two examples before me from Cyprus form transitions between this specimen and the common, lighter form. The name of *luridata* has 8 years priority and must of course be restored. On account of the misidentification, REBEL has accused HERRICH-SCHÄFFER's figure, which was copied from the type, of being "misslungen"; it is really fairly good. *luridata* differs from *marginepunctata* in its more sandy, ochreous or reddish colouring, in having the vertex concolorous, not whitish, the collar not darkened, the discal dots less black and the middle line more zigzag; the costal spot from which the latter commences is in *marginepunctata* almost always placed well beyond (distally to) the discal spot, while in *luridata* it is almost vertical to it, the line, in spite of its strong outward bend, passing close to the spot or even touching it. There are many other less constant differences, but these will suffice, and most of them also serve to distinguish *luridata* from the more similarly coloured *permutata*. Its average size is rather smaller than either. The under surface is glossy and devoid of markings. Whether the dark-marked name-type represents a local race can only be decided when further material is available from Rhodes or the adjacent country. I suspect that it does not; in any case quite light forms occur in Cyprus.

coenosaria.

— ab. **coenosaria** Led. therefore appears to be the correct name for the ordinary forms. Ground-colour paler, sometimes even whitish, the markings pale reddish ochreous or reddish grey, varying somewhat in intensity but usually rather weak. Greece to Persia, Zerafshan and Ferghana, also common in Syria and Northern Egypt. It first appears on the wing in March and April and there are two or probably three broods during the summer. PÜNGELER bred it at the end of June from April eggs, and in September—October from those of the June brood. The larva is similar to that of *marginepunctata* but more shaded with brownish, very slender and without protuberances, slightly ridged laterally. Until after the last moult it is almost without markings; in the final stadium sometimes with sharp or weaker dark dorsal markings, somewhat in the form of broken crosses. Pupa also similar to that of *marginepunctata*, slender, amber yellow, the cremaster normal.

submutata.

A. submutata Tr. (= *contiguarina* Dup. nec Hbn.) (4 c, as *consolidata*; 4 i) is again similar, particularly in certain of its forms, to *marginepunctata*, and on account of the strong variability of both species it is not easy to point to distinctive characters which are absolutely reliable in all cases, except that the distal margin of the hindwing is more crenulate. The ground-colour is whiter, without the ochreous tinge which is so usual in *marginepunctata*; when it is darkened at all (as in our figure 4i, which unfortunately is a little exaggerated) it is rather of a bluish grey than at all brownish. The distal grey shading, which in this species is never absent, though variable in extent, is appreciably tinged with bluish. The distal marginal black spots are enlarged into dashes, indeed in the most typical forms almost or quite united into one continuous line; this line on the forewing is continued round the apex and for some distance along the costal margin. The last is perhaps the most reliable character of all. The postmedian line is usually as irregular as in *permutata* and has on the forewing, with few exceptions, a sharper and blacker tooth on the first radial vein than on the fifth subcostal, whereas in *marginepunctata* these teeth are about equal. The under surface is very weakly marked or entirely without markings, the forewing suffused with grey, the hindwing somewhat paler, or in the palest forms clear white. Vertex and collar as in *marginepunctata*. Egg elongate, ribbed, coral red. Larva very elongate, scarcely attenuated anteriorly, only feebly carinated laterally; green with a broad white lateral stripe. Feeds chiefly on thyme. Pupa very like that of *marginepunctata*. The imago is double-brooded, May to June and August to September. Distributed through Southern and parts of Central Europe and Asia Minor. —

marginata.

ab. **marginata** ab. nov. has almost the entire area of both wings between the postmedian line and the distal margin filled up with dark grey, leaving only a small costal spot, the zigzag subterminal line and some

gianellaria.

narrow marks at the distal margin white. I have a fine example from Bejar, Spain. — **gianellaria** Trti. (= *vigilata* Mann MS., in coll. ZELLER) is a dwarfed form which shows some tendency to establish a local race in Sicily and Capri. It is usually of a clean white ground-colour, rather sharply marked, the dark mark-

submutulata.

ings in the distal area rather strong between the radials and towards the posterior angle. — **submutulata** Rbl. is a similarly dwarfed form from the Morea, but differing from *gianellaria* in being more weakly, not more strongly marked, the ground-colour equally pure white.

farinaria.

A. farinaria Leech is bluish white-grey finely powdered with brownish, similar in colour to the greyest

submutata. It is rather similar to certain weakly-marked forms of that species (and especially of *Glossotrophia confinaria*) which lack the distinct dark discal spots, but the marginal line is quite different, being broken into spots and not continued round the apex. Under surface rather well marked, that of the forewing smoky, of the hindwing whiter. Only a single specimen is as yet known, a ♀ taken at Chia-ting-fu, W. China, in July. The locality is scarcely within the Palearctic Region.

A. incanata L. (= *variegata* Scop. = *mutata* Tr.) (4i). Although the early entomologists seem frequently *incanata*. to have confused this species with *marginepunctata*, there is really little excuse for so doing. The whitish grey or cinereous ground-colour is always distinctive, the average size is considerably larger, the lines never arise from dark costal spots and although their course is variable they are generally more regular; in particular, the postmedian line of the forewing does not bend markedly outward near the costal margin, but is either approximately parallel to the distal margin throughout or merely makes a shallow curve proximad between the radials. The subterminal line is of more uniform thickness throughout, sometimes nearly straight, at other times more or less lunulate-dentate, but seldom, if ever, so deeply and irregularly as in *marginepunctata*; the dark shading proximally to this line, whether weak or strong, is uniform throughout, while in *marginepunctata* it oftener forms pairs of conspicuous spots. Forewing beneath grey, hindwing whitish; the latter generally better marked than in *marginepunctata*, the discal dot nearly always remaining sharply black, the postmedian line generally distinct. — **adjunctaria** Bdv., described as a separate species from the mountains *adjunctaria*. of Lombardy and since recorded by MILLIÈRE from the Maritime Alps, is a darker grey form but apparently not otherwise differing materially; STAUDINGER and REBEL doubt whether it is more than an aberration. There is in most localities some variation between whiter and greyer forms and either may be more strongly or more weakly marked. — The egg of *incanata* is laid upright and the upper (micropylar) end is a good deal broader than that by which it is attached; the sculpturing consists of about 18 longitudinal ribs, converging in the deep micropylar depression, and there are also finer and slighter transverse ribs. The colour is yellow at first, becoming spotted with red. The larva is very slender, nearly cylindrical, whitish grey or yellowish grey; first 5 abdominal segments with narrow elongate-oval dorsal markings, pointed at their extremities, bisected by the dorsal line; dorsal stripe especially distinct on the posterior segments; each segment with a pair of dark dots anteriorly and a pair in the middle at the anterior end of each oval. Feeds on thyme, Caryophyllaceae, etc. The pupa is brown-yellow, the blunt cremaster bearing the usual armature. The moth appears in June to July, or in its more southern stations in May with a second brood in August, and inhabits chiefly mountain districts. It is distributed through the greater part of Europe (excepting the North-west and extreme North), Asia Minor, Transcaucasia and Altai.

A. grisescens Stgr. (4i) is closely related to *incanata*, with which it agrees in shape and markings. It is *grisescens*. considerably darker, of an almost uniform dark grey, the only distinct marking being the pale subterminal line, though the lines and cell-spots are not absolutely obliterated. The forewing beneath is as above, the hindwing paler with a moderately distinct postmedian line and cell-spot. The ♂ hindtibia is little thickened (less so than in *incanata*), the tarsus fully as long as the tibia. Local in Western Turkestan.

A. bifalsaria nom. nov. (= *falsaria* Leech, nec H.-Sch.) (3 l, 5 e). Whitish grey with the lines tending to *bifalsaria*. form, or to be accompanied by, darker bands, particularly the postmedian, which is followed by a characteristic brownish-tinged band reaching to the pale subterminal line. The first line or band does not reach the costa, and is wanting on the hindwing; the second (the median shade) is bent near the costa of the forewing, then fairly direct, crossing the cell-spot on the hindwing. Both wings with black discal dot and distal marginal line. Hindwing beneath paler, both wings with indistinct discal dot and postmedian line. Hindtibia in ♂ thickened. The antennal ciliation in the ♂ is longer than in the two preceding species, the forewing slightly less pointed, the hindwing with distal margin slightly bent in the middle. A more brownish admixture further distinguishes it from similarly marked forms of *incanata*. Inhabits several localities in Western China, occurring in June and July.

A. frigidaria Möschl. (= *impauperata* Walk. = *defixaria* Walk. = *okakaria* Pack.) (5 b). Recognizable *frigidaria*. by its rather broad, relatively short wings, their glossy texture, strong dark powdering and weak markings. From the dark forms of *ternata* Schr., to which otherwise it would most nearly approximate, it differs in the structure of the hindleg of the ♂, the tibia being entirely without spurs, although the tarsus is not shortened. Antennal ciliation in the ♂ of medium length. Forewing with inner line rarely discernible. Both wings with median shade rather thick, little darker than the ground-colour; outer line usually more distinct, nearly parallel with the distal margin. Underside less densely dusted, especially on hindwing. Originally described from Labrador. I have seen no Palearctic examples, but it is said to occur in Kamtschatka, in a form still more

strongly approaching *A. ternata perfumata*. PACKARD, who has by an error (corrected in his text) figured the Labrador form as *spuraria* (nec *spuriaria* Chr.), commits a second error in regarding it as a variety of the *schöyeni*. North American *inductata* Guen. — *schöyeni* Sp.-Schneid., which also is unknown to me in nature, is said to be a little smaller than typical *frigidaria*, but to show no important differences. It inhabits Arctic Norway and Arctic Finland.

cajanderi.

A. cajanderi Herz, only known to me from the description, seems to be nearly related to the preceding, possibly even another form of it. It is described as varying from dark grey to reddish brown, thickly dusted with black scales, glossy; discal spot present or absent; forewing with 2—4, hindwing with 2—3 indistinct dark transverse lines and with a distinct black distal marginal line; the middle line the strongest on both wings; under surface a little lighter. Somewhat broader than *frigidaria*, distal margin of forewing more convex. Antenna in ♂ serrate, shortly ciliated. A series of 11 specimens was taken at the junction of the Vilui with the Lena River, Siberia, 22. to 24. July, and a worn example was also met with at Verkhoiansk. I possess an undetermined ♂ from Barracouta Bay, 28. July, which may possibly belong here, although the fauna of the Lena District is more nearly of a circumpolar character. The specimen in question is likely to be of the species which STAUDINGER identifies as *fumata* (= *ternata*) from Amurland; but if so, he must have neglected to examine the structure, for the hindleg is without spurs and the hindwing has the second subcostal vein shortly stalked. Otherwise it is remarkably like some Arctic forms of *ternata*. The figure of *cajanderi* does not show whether the second subcostal vein of the hindwing arises from the apex of the cell or is very shortly stalked.

marcidaria.

A. marcidaria Leech (31). Whitish suffused with yellowish, especially in basal part of forewing and on the veins. Lines darker yellowish, rather diffuse and ill-defined. Inner line of forewing usually lost in the basal suffusion; median line rather thick and oblique, closely following the cell-spot on the forewing, passing proximally to it (sometimes touching it) on the hindwing; postmedian line somewhat dentate, usually a little incurved between the radials and in submedian area; two thick outer lines enclosing the whitish subterminal, commonly meeting on the veins so as to break up the subterminal into spots; cell-spot minute but black. Hindwing slightly angled at extremity of third radial. Underside less yellowish, forewing slightly suffused with grey, hindwing more white, both wings with the cell-spot and the lines distally to it well expressed; distal margin with brown line and dots. Face concolorous with wings. Antennal ciliation in ♂ long, hindtarsus considerably shorter than tibia. Western China: Wa-Shan, Chia-ting-fu and Ta-chien-lu, June and July. — ab. **intaminata** ab. nov. has the lines finer, of a rather brighter yellow, the basal suffusion of the forewing confined to a streak along the anterior edge of the cell. Wa-Shan in June, one ♂ (type) from the LEECH collection, now at the British Museum.

lutearia.

A. lutearia Leech (31) resembles *marcidaria* in general aspect, but is more strongly and uniformly yellowish or ochreous in tone, lacks the black discal dots and in particular has the margin of the hindwing scarcely appreciably bent. The median line is still thicker, and the shading on either side of the subterminal occupies nearly the whole of the distal area, only separated from the postmedian by a narrow pale line. Similarly the under surface of the forewing is more strongly suffused with yellowish brown. Face blackish. ♂ antennal ciliation shorter, hindtibia strongly thickened, tarsus much abbreviated. Ichang and Chang Yang, June and July.

floslactata.

A. floslactata Haw. (= *remutata* Schiff. nec L. = ? *fulvostriata* Goeze = ? *brunneata* Goeze = ? *fulvicans* Geoff. = ? *strigata* Geoff. = ? *cariata* Schr. = *lactata* Haw. = *spataceata* Wrnbg. nec Scop.) (41). Yellowish white, sometimes slightly more tinged with greyish, with scattered black atoms. The lines light yellowish brown, sometimes a little greyer; first line of forewing weak, sometimes absent, usually placed rather far from the base, thus near the middle line, with which it is sometimes more or less connected by dark shading in the middle of the wing; middle line sinuous; postmedian usually more sharply expressed, dentate outwards and with moderately strong curve inwards between the radials and usually in submedian area; subterminal dark lines never strong, sometimes wanting or the proximal alone present; forewing very rarely with a small and weak dark cell-dot, hindwing usually, but not invariably, with a small black one; distal margin often without black dots, sometimes with some very minute ones in anterior half, very occasionally continued further posteriorly. Under surface of forewing, especially in the ♂, slightly clouded with smoky brownish from base to median line and from costal margin to somewhat behind the cell; median and postmedian lines rather more smoky in colour; cell-dot often present. Hindwing beneath whitish, usually with distinct cell-dot and postmedian line, often also with the proximal of the subterminal lines present, though less prominent. Antennal ciliation in the ♂ little longer than the diameter of the shaft, hindtibia thickened but not shortened, tarsus scarcely one-fourth of its length. Moderately variable, chiefly in the distinctness of the lines and the strength of the teeth and curves in the postmedian line, but also to some extent in the ground-colour, which is at times

somewhat suffused with smoky throughout or in the basal area of the forewing, and even somewhat in shape, as the distal margin of the hindwing is occasionally almost rounded but usually appreciably bent at the third radial. — ab. *conjunctiva* ab. nov. is a not very rare form in which the first and median lines of the forewing *conjunctiva*. are entirely united into a narrow brown band, the space between the median and the postmedian consequently widened. — ab. *sublactata* Haw. is a rather rare aberration with only the two principal lines present, but *sublactata*. these rather strongly expressed. Possibly *brunneata* Goeze (= *strigata* Geoff.) was founded on a less strongly marked example of this same aberration, in which case GOEZE's name would have priority, not only for the form but for the species. WERNEBURG determined it for *nemoraria* Hbn., which does not occur near Paris (GEOFFROY's locality) and is not, on the underside, "sans points". It may be here remarked that the synonymy of the present species is in a more unsatisfactory condition than that of any other, probably, of the Acidaliids. It is quite generally known that the name of *remutata* Schiff. (= *remutaria* Hbn.) was founded only on a misidentification, but only WALLENGREEN had the courage to correct it and he used *floslactata* Haw., which I have followed. It is much to be regretted that WERNEBURG's determination of *spataceata* Scop. is untenable, for the discovery of a really early name would conduce to stability. In the mean time, quite a number of old names exist which have sometimes been referred here, but mostly (*concatenata* Hfn., *trilineata* Hfn., *centrata* F., *dentilinearia* Bkh., *inspersata* Schr.) in more or less manifest error. *lactata* Haw. is well known to be synonymous with *floslactata* and had "page-priority", but both were published together and I therefore follow WALLENGREEN's choice, without commending it. — ab. *extirpata* F. *Fuchs* is a still rarer aberration with all the lines obliterated, no dark marking except the speckles remaining. — The egg is laid upright, and is a long oval, with truncate apex; the sculpturing consists of about 18 strong longitudinal ribs, the furrows crossed by about 25—27 much slighter transverse ribs; the colour is at first pale yellow, but becomes so strongly blotched with crimson that to the naked eye it appears wholly of that colour. The larva is slender, rather uniformly cylindrical, the skin rather rough, the segmental divisions not very conspicuous; the colour varies from pale grey to dark reddish-brown or olive-brown, the medio-dorsal line is slender and greyish and there are usually some pale lateral marks. It hibernates almost full-fed, and seems more difficult to bring safely through the winter than most of its congeners. The moth appears at the end of May and in June and is often abundant. It usually rests among bushes by day and may often be observed sitting on the upperside of a leaf, not or scarcely at all concealed. It flies lazily at dusk and is then very conspicuous. It occurs chiefly in woods and inhabits Central and Northern Europe (except the Arctic Region), N. Italy and the Ural. — *claudata* subsp. nov. *claudata*. differs in having the lines thicker, in general slightly more ochreous, but not strongly expressed, the median further removed from the inner line, being either placed midway between this and the outer line or even rather nearer to the latter. The hindwing has its distal margin nearly rounded. Japan, without exact locality; type in coll. L. B. PROUT. Herr PÜNGELER has a pair from Yokohama, Mr. WILEMAN a ♀ from Oyama (Sagami), 19 May, and the British Museum a ♀ example from Oiwake. The aspect is decidedly different from that of European *floslactata* and it may be a separate species, though it is probably the species recorded for Japan under the name of *remutaria*. I can find no essential difference in structure. The ♂ antennal ciliation may be very slightly longer or the ♂ hindtarsus slightly shorter in *claudata*, but neither is at all obvious. I have not chosen the name to distinguish it from *floslactata* but from its other Japanese allies, one, at least, of which (*superciliata*) is confusingly similar until the structure is taken into account. The discal dot of the hindwing, as in the European *floslactata*, may be either present or absent.

A. superciliata sp. nov. (4 n, fig. 3) bears a very close superficial resemblance to *floslactata claudata superciliata*. Prout, but differs materially in the ♂ structure, which suggests that it is intermediate between *floslactata* and *immutata*. The antennal ciliation is longer than in the preceding species and the hindtarsus is at least one-half as long as the tibia. The ground-colour is slightly lighter or cleaner than in *claudata*, though still with a tinge of yellowish, the lines on the whole not quite so thick, the forewing beneath more strongly suffused with smoky, with conspicuous dark postmedian line and broad pale subterminal, much like that of *marcidaria*, which differs essentially in its pale face. In the type form both wings have a small but conspicuous black discal dot above, but this is very faint in a Yokohama ♂ and may prove to be wanting in some ♀♀. The ♀ is not yet certainly known. If examples from Chang Yang (unfortunately without corresponding ♂) belong here, it seems to lack the discal dots and (like nearly all the group) to have the forewing beneath less darkened than in the ♂. Japan, type and a cotype in my collection; Yokohama, in that of the British Museum; ? Chang Yang.

A. confusa Btl. (3 m, 4 n) is considerably smaller than *superciliata*, the distal margin of hindwing *confusa*. slightly more irregular, the ground-colour whiter, the yellowish markings still stronger, postmedian line even more bent, darker-margined distally at the bends, both wings with much larger black discal spot. The ♂ hindtarsus is longer, at least two-thirds as long as tibia. A very easily recognized little species. Distributed in Japan, May to July and in September; also at Gensan, Korea.

disclusaria.

A. *disclusaria* Chr. is unknown to me, but is stated by STAUDINGER to belong in the vicinity of *flos-lactata* and *pudicaria*, and certainly his figure suggests a near relative of *pudicaria*. Ground-colour nearly as in *immistaria*, light straw-yellow or somewhat sulphur-yellow, lines and discal dots very distinct, distal marginal dots present but varying in distinctness; postmedian line sinuous and twice incurved, about as in *floslactata*, although possibly (according to the figure) rather less distinctly dentate, subterminal line indistinct. Hindwing weakly bent at extremity of third radial. Under surface whitish yellow, the costal margin of forewing and the fringes coloured as above; discal dots and the lines beyond them sharply expressed. Amurland: Vladivostok and Sutschan, end of June and beginning of July.

pudicaria.

A. *pudicaria* Motsch. (4i). On account of the defectiveness of the original description and the existence of several closely related species in the Eastern Palearctic Region, we cannot be absolutely certain regarding the identification of this species. STAUDINGER's determination, which should be accepted, rests on two ♂♂ in the LEDERER collection which were so named and which (like the original) came from Japan. A good deal like the more weakly marked forms of *floslactata*, in which the minute black discal dot of the hindwing is wanting above, but with both discal dots present on the under surface. Colour on an average less yellowish. Hindwing above with the postmedian line further from the distal margin, this line obsolete beneath; on the contrary the underside shows a distinct outer line representing the proximal edge of the subterminal. In *floslactata* and *superciliata* beneath these lines are often both present, the inner (the true postmedian) the stronger, or if only one is developed this seems to be always the true postmedian. ♂ antennal ciliation longer than in *floslactata*, hindleg similarly formed. The ♀ is generally whiter than the ♂, both above and on the forewing beneath, but ♂♂ do occur with the forewing white beneath, only with some dark speckling in the region of the subcostal vein. Japan, Amurland, Korea, Chang Yang, occurring from the

nupta. latter part of May to July. — ***nupta* Btlr. (31, 4 m fig. 6)** appears to me undoubtedly only the second-brood form of *pudicaria*, although experimental evidence has not hitherto been obtained. Excepting its smaller size, I can find absolutely no constant difference, and it is significant that all the dated specimens which I have seen (in the WILEMAN collection) were taken at the end of August. On an average this small form is weakly marked, sometimes of a nearly pure white, the hindwing beneath with the characteristic line sometimes nearly obsolete, as also the discal dots of both wings. More strongly marked specimens, however, also occur, and I have seen a few in which a minute black discal dot is present on the forewing above, such as I have not yet observed in first-brood *pudicaria*. I have only seen the form *nupta* from Japan and Korea (Tokio, Yamato, Kiushiu, Fusan, etc.).

nivearia.

A. *nivearia* Leech (4 m). Very small, white. The lines pale ochreous grey, not very sharply defined, in the type ♀ almost obsolete; inner line of forewing very faint; median and postmedian approximated, parallel with distal margin, little waved, not dentate; sometimes a weak line beyond postmedian, indicating the proximal boundary of the subterminal. Both wings with some minute dark speckling at distal margin; hindwing with distinct black discal dot. The under surface rather recalls that of *pudicaria*, the lines being brown, rather well expressed, at least costally; forewing in ♂ with some fuscous suffusion in anterior half of basal area. Face blackish. Antennal cilia in ♂ little longer than the diameter of the shaft, hindtarsus one-half as long as tibia. Japan, without exact locality; apparently rare. Easily distinguishable from even the tiniest specimens of *pudicaria* (*nupta*) by the straighter lines, the longer ♂ hindtarsus and other characters. Its relation to *caricaria* and possible occurrence in Amurland are discussed under that species.

nemoraria.

A. *nemoraria* Hbn. (= *aliata* Heinem.) (4 k). Larger than *superior*, the wings relatively broader, otherwise resembling a very weakly marked form of that species. The lines are thin, never strong, usually only two present on each wing, or the forewing in addition with an indistinct inner line. Cell-spots absent above, present below. Black marginal dots minute, usually restricted to a few at the anterior part of each wing. Very easily recognized by the unusually broad wings and white face, and little variable. Local in Germany, Switzerland, Hungary, Livonia, the Ural and Altai Mountains, occurring from the end of May to July. Other localities (W. China, Amur and Ussuri) are given by STAUDINGER and may be correct; but it is possible that they refer to *superior*. I formerly thought that the last-named might be a smaller, narrower-winged variety of *nemoraria*, but the genitalia confirm the validity of the other differences. The early stages are apparently still undescribed. My friend Mr. E. M. DADD tells me that the egg is at first pale yellow, afterwards pink. Larva when first hatched rather long and slender, pale yellowish brown, with the lateral ridge defined. They were fond of curling up into half rings. Later they became relatively shorter and stouter, more recalling *Ptychopoda pallidata*. 3 only out of several hundred larvae produced a second generation.

superior.

A. *superior* Btlr. (4 m) is another clear white species with light ochreous-brown or ochreous-greyish markings, and as these are arranged nearly as in *pudicaria* and *nupta* a confusion with the latter might some-

times be possible but for one simple and convenient distinction; the face is white, as in *nemoraria*, while in the other allied species it is black or deep fuscous. Usually also each wing bears a deep black discal dot, both above and beneath, but this is occasionally, though rarely, obsolete, at least in the forewing. Distal margin with minute black dots, at least in the anterior half of the forewing. Lines thicker than in *nemoraria*, subterminals very rarely wanting. Forewing beneath often more or less suffused or dusted with fuscous in its anterior part, variably in degree and not confined to one sex; a dusky postmedian line or thicker shade and usually two weaker, sometimes incomplete lines beyond it. Hindwing beneath white, with a single line. ♂ antennal ciliation not long, hindtibia greatly dilated, with thick hair-pencil, tarsus very short. Variable in size and in strength of markings. — ab. *sancta* Btlr. is an extreme form, weakly marked and with the black terminal dots entirely obsolete, the discal spots indistinct. — Japan, Korea and Palearctic China, extending westward to Omei-Shan, locally common. There is probably a succession of broods, certainly two. April specimens are generally larger; from July onwards smaller specimens occur. *sancta*.

A. *leuraria* sp. nov. (3 m as *sedataria*). Excessively like the largest, whitest forms of *superior*, but with a black face. Beyond this I can point to no absolutely certain distinctions. The lines are not quite so strongly dentate, but on the other hand appear more strongly angled near the costal margin of the forewing; when perfect specimens of both species are compared side by side, the colour of the lines is seen to be somewhat brighter ochreous in *superior*, but the difference is exceedingly slight; the outer subterminal line is obsolete in the type specimen (which we figure), but when present it is more continuous and more even than in *superior*, where it tends to break up into a series of separate spots. On the underside the postmedian line is not so strongly expressed as is usual in *superior*. The structure of the two species is quite similar and both show the same range of variation in respect of the discal and marginal black dots, but their good development seems to be the rule in *superior*, the exception in *leuraria*. The postmedian line is very variable in position; in the type it is very near the inner subterminal, in the Gensan cotype near the median, in the third example more intermediate. A very smooth, glossy species, but not quite so pure white as *subpunctaria*, smaller and rather narrower-winged; our figure, however, exaggerates the narrowness, as the posterior margins in the original are somewhat folded over. Gensan, June 1887, J. H. LEECH, type (♂) in coll. PÜNGELER, cotype (♀) in British Museum; Ichang, June 1888 (♀) in British Museum. *leuraria*.

A. *subpunctaria* H.-Sch. (= *punctata* Scop. nec Cl., = *cerusaria* Lah. = *depunctata* Gn. = *nemoraria* Frr., nec Hbn.) (4 k). White with very fine and sparse black atoms, the lines light greyish ochreous, varying somewhat in number and direction. Usually the three principal lines of the forewing and two of the hindwing are present, the median and postmedian both bent near costal margin of forewing, the former usually more oblique than the latter, thus separating further from it towards the posterior margin. Often the proximal of the outer lines is likewise present, and very occasionally the distal also. Cell-spots small and black, rarely obsolete, sometimes slightly enlarged on under surface. Terminal black dots variable, strong, weak or absent. Under surface of forewing in ♂ with strong or weaker dark dusting costally and distally, the curved median and dentate postmedian lines usually present; in ♀ whiter, the dusting almost entirely wanting or confined to the region of the subcostal vein, the median line obsolete. Hindwing in both sexes white beneath, with an outer line as in *pudicaria* Motsch. Purer white than *pudicaria*, slightly broader-winged, antennal ciliation in ♂ short; hindtarsus, as in most of the group, only about one-fourth as long as tibia. Except in rare aberrations the strong black discal (and sometimes also terminal) dots further give *subpunctaria* a distinctive aspect. — ab. *extirpata* ab. nov. is entirely without markings both above and beneath, excepting the discal dots, which are extremely reduced in size. — The egg is oval, with the usual transverse ribbing, yellow when first laid, becoming red; probably a more exact study will show that this red colour is distributed in blotches. The larva is very slender, pretty uniformly cylindrical, the head small, somewhat flattened. The dorsal line is finely white on the thorax and first abdominal segment, interrupted on the next two segments, thence broader, distinct, dark grey. A dark subdorsal is present on the first few and sometimes the last few segments; between it is broken up into spots which sometimes form with the dorsal a cross-shaped pattern. The lateral ridge is sharp and white. The pupa is light brown or greenish brown, the wing-cases yellower. The perfect insect appears in June and July and is very local, occurring at Bilbao, some localities of S. W. France, N. Italy, the Alps, Lower Austria, the Ural and Armenia and again in Eastern Asia from Amurland to Korea. There may be some degree of local variation, and I believe one or two distinct, but closely related species are still confused with it in the Amur region, but these must await good material for their elucidation. Specimens from the Ural seem to be on an average smaller, but otherwise quite similar. *subpunctaria*. *extirpata*.

A. *dignata* Guen. is closely related to the preceding species and has been regarded as a variety of it. But according to a specimen which has been kindly lent to me by Herr PÜNGELER, and which agrees perfectly with GUENÉE'S description, it is certainly a good species. Size and shape of *subpunctaria*, antennal ciliation *dignata*.

in ♂ rather longer, hindtarsus more than half as long as tibia; discal spots enlarged, terminal dots in part enlarged into very short streaks or dashes; forewing beneath rather more uniformly or smoothly infuscated, without the coarse dark basal and costal dusting; the course of the postmedian line beneath is slightly different; the collar is white, whereas in *subpunctaria* it is tinged with pale yellow-brown. Only known from the Altai and Amurland. July. According to VON HEDEMAN variable in the position of the lines, but constant in the large cell-spots.

axiata. **A. axiata** Püng. (3 m) has been confused with *dignata*, but may be distinguished at once by its yellow ground-colour. The transverse lines are extremely weak, being only of a slightly darker, more brownish yellow than the ground-colour; distal margin without black dots. Cell-spots on both wings large, both above and beneath. Under surface otherwise without markings. Hindleg structure in ♂ nearly as in *dignata*. Only certainly known from Central Amurland. Probably of a different tone of yellow from that of *disclusaria*, which is described as sulphur-yellow; in any case differing in the weaker markings and stronger cell-spot, as well as in the more rounded distal margin of the hindwing.

caricaria. **A. caricaria** Reutti (3 k). Forewing broad but with the apex rather acute; white, with the markings greyish ochreous. First line almost or entirely obsolete, the others arranged nearly as in *subpunctaria* and subject to similar but less extreme variability; the fourth line (proximal shade of subterminal) nearly always well developed, little sinuous, often rather thick; black discal spot present or more usually absent; distal marginal line very fine and grey or wanting, never broken into dots. Hindwing rounded, the three lines usually distinct, sometimes also a fourth, forming the distal shading of the pale subterminal; black cell-spot nearly always well developed. Under surface in both sexes nearly as in *subpunctaria*, or the ♂ forewing more strongly smoky; no distal marginal dots. The egg is oval with the micropylar end broader and more flattened, and is either laid on its side or on its narrow end; it is shiny, longitudinally ribbed and with finer, more numerous transverse ribs, the micropyle very finely reticulated. Green when first laid, changing in two or three days to straw-colour speckled with bright red. The larva is long and slender, clay-coloured, with a whitish lateral line, broad but not well defined; dorsal dark line opening out into small rings at the extremities of the abdominal segments; the lateral carination is slight, the transverse folds distinct. The pupa is pale yellow, washed with greenish, the anal extremity brown. The moth flies in May and June and again in the end of July and August and is local in Southern and Central Europe, frequenting damp meadows. STAUDINGER adds Amurland and N. China as further localities; as the Amurland specimens are said to be small with the lines weaker, they may possibly be referable to *nivearia*. Distinguished from small examples of *immutata* by its purer white colour and less dentate postmedian line, placed further from the distal margin. The rather straight lines somewhat recall *nivearia* Leech, which is smaller, with different underside and rather longer ♂ hindtarsus. In *caricaria* ♂ the antennal ciliations are rather long, the hindtarsus less than half the length of the tibia.

apicipunctata. **A. apicipunctata** Chr. (= *arenaria* Leech) (5 b) has rather narrower wings than the few preceding species and of a less pure white, more tinged with brownish. The lines are usually rather indistinct, angled near costa of forewing, the median more oblique than the others, the postmedian incurved between the radials; subterminal white line broad, following a similar course to the postmedian but more dentate, sometimes scarcely indicated, sometimes brought out more strongly by thick dark shading proximally and distally. Forewing with no distinct cell-spot, but with a vague brownish-grey mark, somewhat in the form of a small ring, occupying its position. Hindwing with a very minute, not very black cell-dot. Forewing with a strong black dot on the distal margin between the 4. and 5. subcostals, from which the species receives its name; in strongly marked specimens this is followed posteriorly by one or two others, but always more minute; in less marked specimens it stands alone. Under surface of forewing slightly smoky, of hindwing whiter; both wings with an outer line. Amurland, Central and Northern China and Japan, April to the beginning of September, evidently double-brooded.

immutata. **A. immutata** L. (= *pallidata* Bkh. = *sylvestriaria* Hbn. part.) (4 k). Larger than *caricaria* but smaller than *floslactata*. Forewing rather broad, especially in the ♀, hindwing with the distal margin well rounded and with only a very inconspicuous bend at the extremity of the third radial. The colour varies sexually and to a less extent individually; in the ♀ often nearly white, in the ♂ much more tinged with ochreous brown. The black discal dot of the hindwing is always distinct, often rather large; that of the forewing usually smaller, sometimes indistinct or altogether absent. All the lines are usually present above, the first line of forewing bent in the cell, the second curved, usually rather near it; postmedian line dentate, often stronger than the others; the dark proximal and distal shading of the subterminal sometimes strong, oftener more or less indistinct; terminal black spots oftenest absent, occasionally well developed. On the hindwing the first line (continuing the median of the forewing) usually passes close proximally to or even across the cell-spot.

Forewing beneath in ♂ rather darker, more or less strongly sprinkled with fuscous atoms; both wings beneath with the cell-spot and outer line placed about as in *pubicaria*, the ♂ also with the subterminal markings of forewing more or less developed. ♂ antenna with longish ciliation; hindtarsus fully one-half as long as tibia. Egg almost perfectly cylindrical, the ends only slightly rounded; about 15 powerful longitudinal ribs, the transverse ribs exceedingly fine, about 15—18 in number; delicate greenish-yellow, becoming after 2 days pale pink with scattered crimson spots. Larva rather slender, nearly cylindrical, tapering towards the head, the subsegmentation distinct; grey-brown with fine pale medio-dorsal line, its fine dark edges thickened into black dashes at the ends of the segments; an ill-defined dark supra-spiracular line and a rather pale lateral stripe containing the black spiracles. On *Valeriana officinalis*, *Spiraea ulmaria* and other plants. Pupa pale brown with the wing-cases more greenish. The moth appears in July, frequenting marshy places, damp meadows or damp places in woods. It sits by day among rank grass and is easily disturbed. Widely distributed in Central and Northern Europe, N. Spain, Italy (except the south), Croatia, S.W. Russia and Armenia; also reported from Amurland. — ab. *myrtillata* Dadd is a somewhat whiter form, nearly as clear as *caricaria*, the dark shading *myrtillata*. on each side of the subterminal almost entirely wanting, the entire area distally to the postmedian line being therefore virtually without markings, at least on the forewing. As the original specimens on which the name was founded (taken in the Berlin district) appeared rather broad-winged, with distal margin straighter than usual, the apex therefore appearing more pointed, and showed a few other slight differences, and were taken among bilberry apart from *immutata*, they were at first believed to represent a separate species. Subsequent experience, however, has not confirmed this and I regard the type-specimens, which were very kindly sent me by Mr. DADD for examination, as representing quite clearly an aberration of *immutata*. I have taken the same form in Essex in company with typical specimens and far away from bilberry. — *syriacata* *syriacata*. *Neuburger*, described as a variety of *immutata*, is unknown to me. It is said to be smaller, brownish (light fawn-colour), the lines well expressed, particularly the two which border the subterminal. Underside somewhat glossy, more uniform than in the type, the forewing not darkened. Taken in the Lebanon.

A. corvivalaria *Kretschmar* (= *sylvestriaria* var. *H.-Sch.*) (4k). Forewing shaped about as that of *corvivalaria*. *immutata* or with the apex slightly more prominent, hindwing more bent in the middle (not shown in our figure). The average size is smaller than that of *immutata*, the colour more brownish than in even the ♂♂ of that species, the lines, discal and terminal dots similarly arranged, the discal dot of forewing nearly always well developed. Forewing beneath with the median line or shade usually well developed; hindwing beneath with the true postmedian line present (as in *floslactata*), the line beyond it usually less strong, or obsolescent. ♂ antenna somewhat thicker, the joints a little swollen, the ciliation longish. ♂ hindtarsus relatively a little shorter than in *immutata*. The egg is pale yellow when first laid, becoming rose-red in two days; I know of no more detailed description, but it will doubtless prove that the red colouring is arranged in blotches, as in nearly all the species. The larva is very slender with the head rather small, the lateral ridge rather strongly developed, the spiracles black; the ground-colour is light grey mixed with yellow, with a double dark dorsal line and fine light lateral line, the ventral area blackish with light longitudinal line. The moth flies in June and July and inhabits damp meadows. It sits by day deep down among long grasses, resting with outspread wings on the upperside of leaves of *Caltha*, *Ranunculus*, *Lythrum*, etc., and the ♀ is not readily disturbed. The flight is slower and less long-sustained than that of *immutata*. *corvivalaria* is an extremely local species. In Europe it seems to be restricted to Holland (Limburg), N. Germany and the St. Petersburg district. According to STAUDINGER it reappears in Eastern Siberia and Korea and is perhaps represented by a local race in Japan. I have not seen examples from any of these latter localities. The range of variation is very slight. SNELLEN says that his Dutch examples are darker than the N. German which were sent him by ZELLER.

6. **A. pallida** *Warr.* (= *peralba* *Swinh.*), erroneously recorded by BUTLER in the "Illustrations of Hetero- *pallida*. cera in the British Museum" as *sylvestriaria* *Hbn.*, has the wings, especially the forewing, considerably narrower and rather more glossy than in *immutata* *L.*, its weakest-marked forms recalling on the upperside *Ptychopoda subsericeata* *Haw.* almost more than any Palearctic *Acidalia* with which I can compare it, though it is larger than the species mentioned, the forewing with distal margin more oblique, apex more acute, the markings stronger, black discal dots present, etc. The neuration is quite normal. The ground-colour of the wings is approximately the same as in the ♀ of *immutata*, sometimes even purer white or with a faint suggestion of a bluish rather than a yellowish tinge. The lines are slightly more greyish than in *immutata*, the median shade oblique, on the hindwing usually placed much proximally to the discal spot, the white subterminal line rather broader and more nearly straight. Discal dots on an average smaller. Under surface much more strongly glossy than in *immutata*, the forewing suffused (not speckled) with more reddish brown, paler between the median line (which is ill defined) and the postmedian, darker distally, the broad white subterminal therefore conspicuous. Hindwing beneath more nearly as in *immutata* but without the sparse dark speckling. Structure not essentially different from that of *immutata*, the ♂ hindtarsus longer in proportion, not much

shorter than the tibia. *peralba* comes from the Shan States, but the species is widely distributed in the mountains of Kulu, Dharmasala, etc. There seems to be little, if any geographical or sexual variation.

coniaria.

A. coniaria *nom. nov.* (= *pulveraria* *Leech*, nec *Snell.*) (3 m, as *pulveraria*) is white-grey, slightly bluish tinged, finely but rather copiously powdered with brown-grey. Body rather robust, forewing rather broader and less pointed than in *pallida*, but less broad than in the preceding group. The lines brown-grey, occasionally clearer grey, arranged nearly as in *pallida*, the oblique median shade nearly touching the discal spot of the hindwing. Discal spots sometimes exceedingly minute, or even absent; never large. Distal area occasionally more strongly dusted than the rest of the wing, the subterminal line then rather distinct, less wide than in *pallida*. Under surface of forewing more or less suffused with brownish smoky except the posterior margin and the subterminal line; hindwing beneath often with indistinct median shade or postmedian line in addition to the outer line. ♂ antennal ciliation rather short, hindtarsus rather less than one-half as long as tibia. Japan: Satsuma and Kiushiu, May and June.

virgulata.

A. virgulata *Schiff.* (= *strigaria* *Hbn.* = *sulcaria* *Hbn.*) (4 k). Easily recognized by its nearly straight and not dentate lines. The pale ground-colour is densely and rather uniformly powdered over with dark scales, perhaps nearest in aspect to rather worn specimens of *turbidaria*. But in *virgulata* the lines are less dark, therefore more weakly expressed except in the least dark-powdered specimens, the median line of the hindwing usually far distally to the discal spot (though extremely variable), scarcely ever forming a direct continuation of that of the forewing; moreover the average size of *strigaria* is larger and it has an appreciable bend in the distal margin of the hindwing. In any case the straight postmedian line should suffice to prevent the possibility of confusion. From *frigidaria* *Möschl.*, the only other dark-dusted species with which it seems even necessary to compare it, it also differs in some of the above-quoted characters, further in its rather less broad wing, browner colouring both above and beneath, the hindwing beneath not whitish as in *frigidaria*. The pale subterminal line is seldom at all strongly defined. Small dark discal dots are generally present on both wings, often fairly strong on the hindwing but weaker on the forewing. The distal margin is without dots, but often shows a fine dark line. Under surface usually brighter and more distinctly marked, both wings with dark discal dot and two more or less sharply expressed, finely dentate lines distally thereto, sometimes also the subterminal shades. Variable in the degree of the dark dusting, the strength and position of the lines and even their course, yet producing no really striking aberrations as regards their general effect. The ♀ is smaller than the ♂, with more pointed forewing. The ♂ antennal ciliation is rather long, the hindtarsus scarcely shorter than the tibia, which is somewhat thickened and flattened. Egg ovate, with the longitudinal ribs strong, about 20 in number, not anastomosing, 15 or 16 very slight transverse ribs, the points where they intersect the primary ribs marked by distinct knobs; colour orange, with red spots. Larva moderately slender, rather flattened dorsally and ventrally, the head small; ground-colour whitish grey slightly mixed with yellow, medio-dorsal pale line very fine and indistinct, bounded by a broad blackish dorsal line, both these lines becoming strongest at the divisions of the segments; the lateral ridge is of the ground-colour; ventral area bluish grey, with a weak and interrupted whitish line in the middle. The imago appears to be partially double brooded and may be met with from May to August. It is widely distributed in Central and S. E. Europe and reaches its most northern limit in Finland; in Asia it occurs in the Kentei Mountains and Urga (Mongolia) and is represented further eastward by a paler race. I have not seen Kentei

parallelaria.

and Urga specimens and it is possible that they also belong to the last-named. — **parallelaria** *Warr.* seems to be the correct name for the race which inhabits China, Korea and S. E. Siberia, but as WARREN describes it (from W. China, without more exact locality) without reference to *virgulata* and I have not been able to compare his type with the eastern specimens, it is possible that the former may need to be sunk to *virgulata* and the latter renamed. This race is decidedly lighter than that of Europe, with very little tint of ochreous, the postmedian line on the hindwing appreciably denticulate, the forewing beneath somewhat infuscated, the hindwing beneath whitish. I have several specimens before me from Gensan, Korea, taken in June and July. — ab. **albicans** *ab. nov.* Under this name I designate a very pretty form from Oiwake, represented by a ♂ and ♀ from the PRYER collection. The ground-colour is quite white, the dusting comparatively slight, the lines conspicuous, especially the postmedian; under surface nearly the same, only with the forewing somewhat smoky, particularly in the ♂. As these are the only Japanese specimens of *virgulata* which I have seen, it is quite likely that they represent a local race rather than a mere aberration. The "strigaria" of the WILEMAN collection do not belong to this species but to *ignobilis* *Warr.*

albicans.

substrigaria.

A. substrigaria *Stgr.* (= *strigaria* *Herz*) (3 m) appears to me doubtfully distinct from the preceding species, but I have only seen one specimen and defer to STAUDINGER's opinion. He thinks that the ♂ antennal ciliation is even somewhat longer than in *virgulata*, but I cannot see that this is appreciably the case

in the specimen before me. In any case, however, it will represent a good local race. It is of a dark mousegrey colour, almost entirely without the ochreous shade of typical *virgulata*, while the strong dusting and extreme weakness of the markings would separate it from subsp. *parallelaria*. Perhaps the most striking characteristic of *substrigaria* is the absence of the discal dots, both above and beneath; even on the hindwing only the very faintest suggestion of it is discoverable. N. E. Siberia to the Southern Altai. HERZ's Witim specimens were captured in July.

A. plumbearia *Leech* (5 f) is very distinct in appearance from all the other Palearctic species, though *plumbearia*. very closely related to the Indian *mecysma Swinh.* The glossy, dark brown-grey ground-colour and the position and course of the markings show a remarkably close resemblance to *Somatina mendicaria* *Leech*, from which it differs essentially in structure, the ♂ antenna being moderately ciliated, without pectinations, the ♂ hindtibia more thickened, with the tarsus shortened (perhaps about one-half as long as tibia) and both sexes easily distinguishable by the neurulation. Under surface rather paler, the median and postmedian lines present, the latter the better developed. Only the original pair from Kiushiu are yet known to me. The ♂ was taken at Satsuma in May, the ♀ at Nagasaki in June. The sexes appear to be quite alike.

A. umbelaria *Hbn.* (= *sylvestrata* *Bkh.* nec *Hbn.* = *compararia* *H.-Sch.*) (4 k). White or whitish *umbelaria*. sparsely sprinkled with blackish; the lines brown, the postmedian sometimes more dusted with blackish. Forewing with first line angled in cell, thence oblique, placed rather near the median shade, seldom very sharply expressed, occasionally wanting; median line curved near costa of forewing then nearly parallel with distal margin or very slightly oblique inwards, sometimes rather thick; on hindwing usually crossing the cell-spot or bending round its proximal side; postmedian line parallel with distal margin or very slightly sinuous; proximal shading of subterminal usually, and distal shading sometimes well developed; distal margin often with very small black dots or dashes between the veins; base of fringe with small black dots, of varying intensity, opposite the veins. Discal dot nearly always present on the hindwing, though usually minute; often wanting on the forewing, very rarely conspicuous. Except that the ♂ is a little more strongly dusted, the sexes do not differ above. Beneath the ♂ forewing is more or less infuscated, the markings usually well expressed, excepting the inner line, the hindwing nearly as above; the entire under surface of the ♀, on the contrary, is rather pale, the markings always weak, sometimes nearly obsolete. The distal margin of the hindwing is weakly angled in the middle, but occasionally so weakly as to be scarcely noticeable. ♂ antenna with the ciliation of moderate length; hindtibia rather short and thick, tarsus more than one-half as long as tibia. The species is generally recognizable by its large size. Larva very elongate, fawn-colour, with dark dorsal stripe and usually some dark dots beside it. Pupa yellow-brown with rounded dark cremaster. Central Europe, S. W. France, S. E. Roumania, Tarbagatai and Altai Mountains and S. E. Siberia, flying in June. — *szechuanensis* *subsp. nov.* is smaller, especially the ♀, the hindwing with the distal margin only *szechuanensis*. very slightly bent (in one or two specimens scarcely appreciably) the ♂ antennal ciliation slightly stronger, the hindtarsus perhaps relatively a little longer, the discal spots extremely minute or wanting, no terminal dark dots, or at most only one or two extremely small and indistinct ones anteriorly (a more noticeable series on hindwing beneath); lines mostly indistinct, the postmedian the best defined, placed rather further from the distal margin, showing more tendency to become dentate and sinuous than in typical *umbelaria*, but rather variable; under surface of ♂ forewing more strongly and uniformly darkened, the lines therefore less distinct; that of the hindwing usually with inner subterminal line defined. Ta-chien-lu and Chow-pin-sa (5 ♂), Moupin (2 ♀), all from the LEECH collection; recorded as *umbelaria*, without mention of the differences, which may well be of specific value. A form recorded (but not described) from Chan-Si by ALPHÉRAKY may prove to be the same. — **majoraria** *Leech* (4 n, 5 c) is a large race from Japan coloured more like the type-form, but with *majoraria*. the lines on an average thicker and more ochraceous; terminal dots wanting, discal dots wanting or a very minute one present on hindwing only. Under surface very weakly marked in both sexes. May to the beginning of July. Two very strongly marked ♀♀ show an ochreous-brown spot on the discocellulars.

A. fumosaria (BANG-HAAS in litt.) *sp. nov.* (3 m) is similar to *umbelaria szechuanensis*, but has shorter, *fumosaria*. broader wings, the hindwing with distal margin quite rounded, and is of a slightly less yellowish white, the lines more greyish brown. Thus to some extent intermediate between *umbelaria* and the purer white group (*subpunctaria*, etc.). Except in its much whiter colour rather recalls certain forms of *ternata* *Schr.*, the dusting and the darkening of the extreme costal edge of the forewing about as in that species. Inner line of forewing weak, median line very weak, the three outer lines better expressed, continued on the hindwing. Under surface, at least of the forewing and the costal region of hindwing, even more strongly dusted with smoke-colour than in *ternata* or in *szechuanensis* both wings beneath with distinct black discal spot, that of the forewing slightly elongate, that of the hindwing narrowly pale-ringed; postmedian and subterminal dark lines moderately distinct on forewing, the subterminals on hindwing also. Antennal shaft moderately

thick, the cilia little longer than its diameter. Hindtibia strongly thickened, tarsus only about one-fourth of its length. Baikal, S. Siberia; described from a single ♂ in coll. PÜNGELER.

nigropunctata.

A. nigropunctata *Hufn.* (= *nemorata* *Bkh.* = *strigilaria* *Hbn.* = *exemptaria* *Hbn.* = *prataria* *Bdv.* = *incanata* *Z.*) (4 k). Closely related to *umbelaria* but smaller, less whitish, the ground-colour being appreciably more testaceous and on an average more strongly dusted. The forewing looks slightly shorter and broader, its distal margin being more strongly curved or bent in the middle so that its anterior part becomes less oblique; the black discal spot nearly always distinct, often large; the median shade, which in the typical form is strong and dark, and the postmedian line are both angled near the costa of the forewing, and the former runs rather more obliquely than in *umbelaria*; the hindwing has the angle in the middle rather stronger on the average, though very variable; both wings have usually a dark terminal line, interrupted at the vein-ends and often thickened between; the black dots in the fringe are very slight or are wanting. Both sexes are sharply marked beneath and differ very little; the basal half, or more, of the forewing is more or less suffused with fuscous, especially on the veins, the inner line wanting; the hindwing has a zigzag outer line. The hindleg in the ♂ more resembles that of *floslactata*, the tarsus being very short. The egg has the normal longitudinal and finer transverse ribbing. The larva is very slender, tapering slightly anteriorly the head rounded, skin transversely ribbed, the spiracles very small, brown; the general colour is greenish grey with a narrow, distinct dull green dorsal line; on the extreme anterior edge of each of the middle segments there is a square black spot, divided down its centre by the dorsal line. It feeds on various low plants. The pupa has six minute hooks on the cremaster in addition to the strong pair of central spines. The moth appears in June and July, or into the beginning of August, and is normally only single-brooded, though larvae will sometimes feed up more rapidly and produce a partial second generation. Central and parts of Southern Europe and through Asiatic Turkey to Persia. The European forms, though somewhat variable in shape and in the strength of the markings, are well understood, and I suspect that those from the other countries named agree with them, though I have no material before me. — In China and Japan, however, with Korea and probably S. E. Siberia, occur a succession of more puzzling forms, extremely variable in size and shape, in ground-colour and in distinctness of markings, which I can only deal with collectively as

subcandidata.

subsp. **subcandidata** *Walk.* (= *imbella* *Warr.*) and which will still need much study. It is greatly to be desired that resident entomologists would investigate them in a state of nature and especially work out the life history. The ♂ genitalia of the only examined specimen agree in every detail with typical *nigropunctata*. In general these *subcandidata* forms differ from the European in having the discal dots considerably reduced in size, occasionally obsolete; the central shade less strong, sometimes somewhat less oblique; the under surface of both wings much more weakly marked. Typical *subcandidata* from Shanghai, is very little dusted with dark and has the angle in the hindwing rather slight. Some of the specimens are as white as *umbelaria*, and some very small ones (about the size of *emutaria*) occurring in September doubtless represent a second generation. Some Japanese examples agree closely with these forms while others have as sharp an angle in the hindwing as in any European example and sometimes as strong (perhaps even stronger) dark dusting, but still differing in their weak markings. Sometimes the distal margin of the forewing is more oblique, producing a somewhat different impression. Possibly there are two or three very similar and variable species mixed up. I think the ♂ hindtarsus is a little less shortened in the true *subcandidata* than in the other forms, but the difference in any case is light. WARREN's *imbella* was a rather small, worn ♀ from Japan. Occasional more ochreous-tinted specimens become, when the angle in the hindwing is weak, confusingly similar to *ignobilis* *Warr.*, although the ♂ hindtarsus of that species is rather longer.

modicaria.

A. modicaria *Leech* (5 e) closely resembles *nigropunctata* in shape, colour and arrangement of markings, both above and beneath, and might almost have been taken for a small variety of that species but for a few details in the markings and especially the fact that the ♂ hindtarsus is fully half as long as the tibia. The forewing has no black discal dot, but bears in its place a less small, rather ill-defined brown spot. The postmedian line of the forewing is less dentate than in some *nigropunctata*, but rather more incurved between the radials; that of the hindwing, though variable, is usually rather straighter than in *nigropunctata*. The distal area of both wings is slightly darker-shaded, containing a very distinct pale subterminal, more irregular than that of *nigropunctata*. In size, and in having the forewing rather broad and the hindwing only quite weakly angled, *modicaria* may best be compared with the small (second brood?) examples of the subspecies *subcandidata*; but it has been taken in April and again in June, July and August, and shows neither seasonal nor sexual variation. Omei-Shan, Chung-King, Kweichow and Fu-chau.

polystigmaria.

A. polystigmaria *Hmps.* (5 d) differs from the small forms of *nigropunctata* in having the hindwing more quadrate, almost smooth on each side of the angle, whereas in *nigropunctata* it is appreciably crenulate. The ground-colour is much more yellowish and with much sparser dark dusting. Postmedian line of forewing

faint, nearer the distal margin and more regular, followed by a series of blackish fuscous spots, somewhat variable in development, but those on each side of the second submedian vein comparatively large, nearly or quite confluent, those on each side of the first median also well developed, but well separate. Discal spot well developed and black. Hindwing similarly marked, the discal spot a little larger than on forewing. Under surface considerably paler, quite weakly marked, but with small cell-spots and some traces of the dark distal markings remaining. Antennal ciliation in the ♂ moderately long, hindtibia not extremely thickened, tarsus not much shortened. — *elyra Swinh.*, of which I have only seen a single specimen, is without *elyra*. doubt merely an aberration, differing solely in having a much deeper ochreous ground-colour. Discovered at Rajaori (Kashmir) by LEECH in September; all the known specimens are from Kashmir, May and September, at 2000 m elevation and upward.

A. sedataria *Leech* (7c). Systematic position somewhat uncertain, perhaps nearer to the *subpunctaria-sedataria* group, notwithstanding that the hindwing has the distal margin elbowed in the middle and that both wings are narrower than is characteristic of that group. In any case a very distinct species; its very glossy, pure white wings distinguish it abundantly from all the rest of the angle-winged species. The lines are brownish grey, not very strong (sometimes quite faint), bent near costa, then rather straight or a little sinuous (in the only ♀ known to me more irregular); usually only 3 are present on the forewing and two on the hindwing. Cell-spots wanting. Forewing beneath infuscated except in distal area; hindwing beneath white, with a single (outer) line. ♂ antenna with long fascicles of cilia, hindtibia rather short and thickened, the tarsus nearly as long as the tibia. Western China: Ta-chien-lu, Chia-ting-fu and Pu-tsu-fong, occurring in June.

A. emma *sp. nov.* Very similar to *A. hanna* *Butl.* in colour and markings, differing as follows: Rather *emma*. larger, hindwing only very slightly (in the ♂ almost inappreciably) bent at the extremity of the third radial; postmedian line of forewing slightly further from distal margin and with teeth (produced by blackish spots at its distal edge) slightly stronger; this line on both wings markedly incurved between the radials; underside of forewing with postmedian line bending proximad at its costal end; underside of hindwing with the true postmedian line obsolete, a distinct fine outer line occupying the position of the proximal dark shading of the subterminal line of the upper surface; ♂ hindtibia more strongly thickened, tarsus scarcely one-third of its length. Chungking, Szechuan, 18 September 1909 (type, ♂) and 22 June 1909 (♀), BARRY. A ♂ specimen of *hanna* was taken by Mr. BARRY on the same day as the latter.

A. hanna *Butl.* (3 m). Ground-colour about as in the paler forms of the wellknown *A. imitaria, hanna*. varying between pale reddish ochreous and more whitish; the markings, on the other hand, more nearly as in *emutaria*. Forewing with first line very faint or obsolete, bent near costal margin, thence running nearly parallel with median shade; median shade rather broad, rather oblique, but reaching the costal margin proximally to the postmedian line or becoming obsolete without touching that line; postmedian very slender, rather weakly expressed, but punctuated with black dots on the veins, its course very slightly oblique and consisting of a series of very feeble proximal curves between the veins; subterminal pale shade marked by weak or very weak dark shading proximally and distally; cell-spot small but black; distal margin with a very fine line interrupted at the vein-ends and often thickened into dots midway between. Hindwing with the median shade passing close on the proximal side of the cell-spot, postmedian line slightly outcurved, but not sufficiently to run parallel to the distal margin, which is distinctly angled in the middle. Under surface similarly marked, but the entire basal part of the forewing more or less suffused with greyish, the hindwing whiter than above, with the postmedian line and sometimes the median well expressed. Our figure is not very characteristic, in that it lacks the black discal dot of the forewing and the angle in the margin of the hindwing. The average size is rather smaller than in that example. ♂ antennal ciliation of only moderate length, hindtibia not extremely thickened, the tarsus about one-half its length. Japan: Yokohama, etc.; Korea: Fusan; Szechuan: Chungking in June.

A. emutaria *Hbn.* (= *subroseata* *Haw.*) (41). Easy to distinguish by its whitish ground-colour, with *emutaria*. slight or rather strong pink flush. First line of forewing faint, placed nearly as in the preceding species, but almost always bearing conspicuous blacker spots on the median and submedian veins. Postmedian line of both wings bent near the costa, otherwise remarkably straight; that of the forewing usually and that of the hindwing often marked only by the conspicuous black vein-dots. Distal marginal line grey, very faint, more or less interrupted, the dots midway between the veins extremely minute. The median shade of the forewing follows a different course from that of the preceding species, being more oblique, meeting the postmedian line at about the first radial and here disappearing. Forewing beneath somewhat suffused with grey, both wings with cellspot and postmedian vein-dots present, the latter usually becoming nearly obsolete towards the abdominal margin of the hindwing. ♂ antenna with strong fascicles of cilia, hindtibia rather short, tarsus

nearly as long as tibia. *A. emutaria* cannot be considered a variable species, although some specimens are much whiter, others much pinker. The egg is nearly always laid upright. It is elongate-ovate, the ends differing less in breadth than in some species, both a little flattened; the longitudinal ribs are distinct, converging into the micropylar depression, the transverse ribbing weaker; pale green, changing in two or three days to pink, formed of a pale ground-colour blotched and ringed with crimson. Larva slender and elongate, moderately smooth, with the usual lateral ridge; head rounded; ground-colour pale ochreous or greyish ochreous, darker ventrally and with a dark dorsal stripe enclosing a pale spot on each segment; spiracles black, conspicuous; on each abdominal segment from the first to the fifth a black dot is placed obliquely beneath them. It feeds on *Statice limonium* and other plants. The pupa is light brown, abdominally darker-ringed, the anal end dark, a little broadened and then tapering very abruptly to the cremastral plate. The moth appears in June and July and there is sometimes a partial second brood at the end of August or in September. It is very local, and as it hides low down among the herbage by day and is less easily disturbed than most *Acidalia* it is perhaps often overlooked. It inhabits marshy places, especially salt marshes, and may be found flying in plenty at dusk. It occurs chiefly in Southern Europe and North Africa, but is also found in the South of England and in some localities in Austria-Hungary.

flaccidaria. **A. flaccidaria** Z. (41) is closely related to *emutaria*, and is regarded by STAUDINGER as a Darwinian form of it. The angle in the margin of the hindwing is strong (our figure therefore incorrect in this particular), the median shade thinner and much weaker, placed further from the postmedian, the distal marginal line or series of spots on the average rather better developed, both above and beneath, the discal spots larger. The ground-colour is typically somewhat more yellowish or less pink. Two extreme colour forms have received separate names. — ab. *albidaria* Stgr. (= *albicans* Bhtsch. nom. nud.) is whitish without any admixture of yellowish or rosy. As it is recorded almost exclusively from localities in Central Asia, it may possibly prove to be a local race. Or again, as STAUDINGER suggests, it may represent the second generation in certain places. But as it seems only to be parallel to the whitest forms of *emutaria*, and BOHATSCH (Jahresb. Wien. Ent. Ver. vol. 2, p. 46) has recorded it from Slavonia among second-brood specimens, I incline for the present to regard it as an aberration only. — ab. *roseata* Aigner (= *rosea* Rbl.) is suffused throughout with bright rose-red, the markings deeper rose-red. The under surface, though strongly marked, is not abnormally coloured. — The early stages of *flaccidaria* have been made known by CARADJA. The egg is elongate-ovate, laid upright, the micropylar end somewhat flattened; whitish yellow, becoming orange within 4 days. The larva is said to resemble closely that of *nigropunctata* Hufn.; probably CARADJA did not possess that of *emutaria* for comparison. Very slender, gradually tapering towards the head; mostly grey-brown or yellowish brown, with a double dark dorsal stripe (in youth also with the ventral area dark); the abdominal segments with pairs of blackish longitudinal streaks before and behind each incision, representing the vestiges of a subdorsal line. Not known from Western Europe, its range only overlapping with that of *emutaria* in Austria-Hungary and S. E. Europe; but extending through Asia Minor, N. Persia and Turkestan, as far as to the Ili district. It is partially double-brooded.

flaccata. **A. flaccata** Stgr. (41) rather nearly resembles *flaccidaria* in colour and to some extent in markings, but is at once distinguished by the shape of the hindwing, which is only very slightly angled, sometimes scarcely at all. The black discal spot is distinct on both wings, but the lines are usually very weak or almost obsolete; the median, which is sometimes better developed, is not oblique on the forewing as in *flaccidaria*, but vertical, merely somewhat curved round the cell-spot; the postmedian is irregular and dentate and is not marked with black dots on the veins. The distal margin usually shows some minute black dots, but these are sometimes wanting. The under surface is whitish, somewhat more tinged with yellow towards the margins; the discal spots are reduced in size and the lines are absent; sometimes, however, there are traces of a dentate subterminal line on one wing or on both. The ♂ antenna is provided with moderately strong fascicles of cilia; the hindtibia is not very strongly thickened and bears a single, short terminal spur, which according to STAUDINGER is sometimes wanting. In some specimens the ground-colour is more reddish. *A. flaccata* inhabits Palestine, north and east of the Dead Sea, and has been taken in March and May. — The form from Biskra, which I name *languidata* **languidata** subsp. nov. is larger, rather narrow-winged, apparently always of the pale, weakly-marked form, the hindwing whitish with minute cell-dot, forewing without cell-dot, underside unmarked. February to April.

imitaria. **A. imitaria** Hbn. (41) is a very distinct species, bearing some resemblance to the genus *Timandra*. This is due partly to the shape, the apex of the forewing being pointed, the distal margin sinuous, often appreciably angled, and the hindwing having the same shape as in that genus; but still more to the markings, the median line, though not so oblique as in *Timandra*, being equally sharply defined and usually followed by some grey or reddish shading, the postmedian line of both wings is sinuous, as in *T. amata*. Ground-colour beneath paler (particularly on the hindwing), but the forewing bears some greyish suffusion, at least in its

basal half. *A. imitaria* is a decidedly variable species, but the aberrations pass into one another by such gradual transitions and are for the most part so little striking that it does not seem expedient to provide them with names. The ground-colour is sometimes very pale, sometimes strongly reddish or again more ochreous; the lines usually well expressed, sometimes quite weak, the median shade now reddish, now grey or even blackish. The discal spot of the hindwing is very rarely obsolescent, but that of the forewing is not infrequently faint and may even vanish entirely. — ab. *kesslitzii* Hirschke is perhaps the most striking form. *kesslitzii*. In this the median line, which generally gives to the species its characteristic appearance, is entirely absent. — The egg is elongate-ovate, strongly flattened at its broader end, with the longitudinal ribbing strong, its coloration as in the allied species. The larva is extremely long and slender, the skin transversely and very irregularly wrinkled; head small, rounded; body pale ochreous with a distinct brown dorsal line, often partly broken up into spots anteriorly, but becoming darker and more continuous posteriorly; ventral surface mixed with fuscous; spiracles black. Varieties occur in which the ground-colour is more grey, or more tinged with greenish or with red-brown, but it is always of some pale shade. The pupa in golden brown, with ochreous yellow wing-cases. The imago appears in June and July, and there is often a partial second brood later. It hides by day in bushes or among rank grass or other plants, flies at dusk and is strongly attracted by light. Widely distributed in Southern and Central Europe, becoming more local eastwards. Also inhabits N. Africa and Asia Minor to Armenia

A. rivularia *Leech* (3 e, 5 e). Pale ochreous brown sprinkled with blackish, the markings fuscous. *rivularia*. Forewing with first line bent in cell, then oblique and dentate; median shade rather thick, dentate, twice incurved; postmedian bent outwards near costa, somewhat incurved between the radials and again posteriorly, also dentate; followed by a fuscous shade; discal mark usually annular, distal margin dotted with black between the veins. Hindwing with distal margin sharply angled at third radial; the markings, excepting the first line, nearly as on forewing, the median shade bending round the black cell-spot on its proximal side. Under surface paler, wanting the inner line of forewing and with the other lines less well developed than above. ♂ antennal ciliation short, hindtarsus about one half as long as tibia. Chang Yang and Moupin in June and July. A large and conspicuous species.

A. bimacularia *Leech* (5 e) is smaller than *rivularia*, the markings more ferruginous and much less zig-zag; the first and median lines of the forewing finer and less strongly developed, the median of the hindwing on the other hand broadly diffused so as to enclose the black-cell-spot; the brown cell-spot of the forewing, though larger than a mere dot, is not annular; the brown shade distally to the postmedian is in general weaker, but contains on the forewing conspicuous ferruginous or blackish blotches at the posterior margin and between the radials, as in the *ornata*-group, the postmedian line itself here black. Underside of forewing suffused, of hindwing whitish, the postmedian line of the former less decidedly, of the latter scarcely at all followed by dark shading, the *ornata*-like blotches wanting. ♂ antenna subdentate, with rather long fascicles of cilia; hindtibia strongly thickened, tarsus about one-half its length. Chow-pin-sa and Pu-tsu-fong, W. China, June and July.

A. extimaria *Walk.* (= *stigmata* *Moore*) from N. W. India is very similar to *bimacularia*, but differs *extimaria*. in having the hindwing only very weakly angled, the ♂ hindtibial hair-pencil black, hindtarsus shorter, the cell-spot of the forewing smaller and darker, the abdomen with some dark dorsal markings and the ground-colour in general slightly more tinged with reddish.

A. moorei *Cotes & Swinh.* (= *similaria* *Moore* nec *Walk.*) is of a more reddish shade than either of *moorei*. the preceding, with finer but more copious dark dusting, giving it a rougher aspect. The angle in the margin of the hindwing, as in *extimaria*, is very slight. The position of the markings is almost exactly as in *bimacularia*, but the inner line and cell-spot of the forewing and the median shade of both wings are still weaker, sometimes almost entirely lost in the uniform dark dusting. The ferruginous blotches distally to the postmedian line are also less well developed than in *bimacularia*, but the blackening of the postmedian itself in these places remains. In the antennal and leg structure I find no appreciable difference. The type form occurs in N. W. India, though originally described from Bengal. — *rufigrisea* *subsp. nov.* (= *walkeri* *Leech*, nec *rufigrisea*. *Btl.*) (3 m as *walkeri*) differs markedly in tone of colour, being of a pinkish grey instead of ochreous-rufous. In consequence of this difference of colour, the ferruginous spots distally to the postmedian line usually stand out better contrasted than in *moorei* *moorei*, though still not so sharply as in *bimacularia*. In one or two specimens before me the angle in the distal margin of the hindwing is rather stronger, forming a transition towards *bimacularia*. Central and Western China from Chang Yang and Ichang to Moupin, showing no variation in tone of colour and very little in the strength of the markings. Flies in June and July.

proximaria.

A. proximaria *Leech* (5 f) is again considerably smaller than *bimacularia* and *moorei*, having only about the size of the largest *ornata* or *subtilata*. Hindwing shaped as in most *moorei*. Colour slightly more reddish than in *bimacularia*, less dark-dusted than in *moorei*. Markings above as in *moorei*, only the postmedian line of both wings more strongly incurved between the radials. Under surface more strongly marked than in *moorei*, a distinct median line present on both wings in addition to the postmedian, usually also some dark shading distally to the postmedian. It is not absolutely certain that this may not prove to be a small eastern form of *moorei*, but the ♂ antennal fasciculation seems to be rather less thick. Central China: Ichang, June and July.

propinquaria.

A. propinquaria *Leech* (3 l, 5 f). Smaller than *proximaria*, the distal margin of the hindwing somewhat crenulate, the tooth at the end of the third radial scarcely more pronounced than the others. Ground-colour white, only slightly more brownish than in *ornata*. First and median lines light brown, indistinct, angled near costal margin of forewing and more or less sinuous throughout; postmedian line light brown, marked with fuscous spots at costal and posterior margins and with smaller dark dots on its teeth; distal area of both wings mostly brown, traversed by a lunulate-dentate white subterminal line, which is strongly widened proximally between the radials and on the submedian fold, usually forming triangular patches, but occasionally so extended as to break the brown band into three separate patches; discal and terminal dots black. Under surface with the postmedian line and the proximal half of the distal dark band present, forewing dark suffused, sometimes showing the median line. ♂ antenna with moderate ciliation; hindtarsus about two-thirds as long as tibia. Appears to be distributed throughout China and in Korea. In the Palearctic Region it flies in June and July, but at Hong-Kong it emerges as early as the end of March.

aequifasciata.

A. aequifasciata *Chr.* (3 i) has the ground-colour clearer white than *propinquaria*, only a little less so than *ornata*; the hindwing is a little narrower than that of the preceding species and is distinctly though bluntly angled. The proximal and median lines of the forewing are in general even fainter, the postmedian, which in *propinquaria* makes a proximal bend at the costal margin, is here parallel with the distal margin, or even slightly bent distad in *aequifasciata*; the dark shading distally to the postmedian is more restricted and more interrupted than is usual in *proximaria*, the distal margin itself (that is, beyond the white submarginal line) mostly white. The hindwing differs still more materially from *proximaria*, the lines being very weak and the distal dark shading obsolete. Under surface weakly marked, the postmedian line of the forewing the most distinct. ♂ antenna with longish fascicles of cilia, hindtibia strongly dilated, tarsus perhaps two-thirds of its length. I have not seen the ♀, but have no doubt that STAUDINGER has erred in placing the species among *Ptychopoda* — perhaps on account of a superficial resemblance to *Pt. trigeminata* *Haw.*, with which CHRISTOPH compares it. The neurulation is absolutely that of *Acidalia*. Only known from Amurland.

satsumaria.

A. satsumaria *Leech* (5 e) is distinguished by its very small size, rather brownish white tone, strongly angulated postmedian line of the forewing, while that of the hindwing is comparatively regular, and by having the posterior dark blotch in the distal area of the forewing more strongly developed than that between the radials. The inner line of forewing and median line of both wings are present, fine and brown, both are outcurved anteriorly and incurved posteriorly on the forewing. Postmedian line of forewing angled distally on the first radial, then running almost straight basewards, right-angled about the second radial, again bent (though not quite so sharply) at the first median. The area distally to the postmedian irregularly suffused with brown, the strongest brown blotch being between the radials and containing a few fuscous scales, while a blotch near the hinder angle is almost wholly fuscous. Subterminal line similar to that of *propinquaria*, its expansions less extreme. Postmedian line of hindwing a little sinuous and subdentate, nearly parallel with distal margin, followed distally by a rather thicker but rather paler brown line. Both wings with black discal dot. Under surface extremely weakly marked, forewing slightly more brownish than hindwing. The distal margin of the hindwing is very weakly angled in the middle. ♂ antennal cilia rather long; tarsus about two-thirds the length of tibia. Satsuma, May, only LEECH's three specimens known to me.

butleri.

A. butleri *nom. nov.* (= *insolata* *Btlr.* nec *Feld.*) (7 c), from Dharmasala, is closely related to the preceding, but I do not think it can be conspecific. The ground-colour is of a rather cleaner white, the markings a rather greyer brown; the postmedian line of the forewing reaches the posterior margin rather nearer to the hind angle, that of the hindwing is placed rather nearer to the distal margin and the line which follows it is better developed. Distal margin and fringe more distinctly marked with blackish than in *satsumaria*. The forewing beneath shows a more distinct dark costal spot, marking the commencement of the postmedian line. *A. pedilata* *Feld.*, from Ceylon, to which HAMPSON has sunk *insolata*, is another allied, but distinct species.

A. concinnaria Dup. (41). Rather larger than most of the group, slightly less pure white than *or-concinnaria*. Easily recognized by the entire absence of markings on both wings excepting the very small blackish discal dot and the distal bordering; the latter consists of the fine blackish lunulate-dentate postmedian line, which is placed rather nearer to the distal margin than in the allied species and is less strongly sinuous, and the blue-grey shading beyond, which is traversed by the white subterminal line and is largely mixed with brown in its proximal half. Beneath the wings are very weakly marked, the forewing a little infuscated. Distal margin of hindwing crenulate and excised between the radials, but not so deeply as in *ornata*. ♂ antenna with slender fascicles of cilia of moderate length; hindtibia thickened and flattened, tarsus a little shorter than tibia. Only known from Spain (Granada, Castile and Aragon); June and July. — **hesperidata** Rbr. is *hesperidata*, possibly an aberration, though treated by STAUDINGER as a synonym. VON GUMPPENBERG regards it as a variety or perhaps a distinct species, but probably only knows it from the figure, which seems to me to depict merely an exceptionally strongly marked specimen; both wings with a fine, tortuous brown median line, forewing also with three black vein-dots indicating the inner line. Our figured example shows the latter and faint traces of the former. Andalusia.

A. ornata Scop. (= *paludata* L. = *instilata* Hufn. = *nivearia* F. = *interrupta* Goeze = *intersecta ornata* Geoff.) (41) was the first known species of the group and may be regarded as its most typical representative. It formed the type of the generic names *Craspedia* Hbn. and *Dosithea* Dup. and should also rightly have been made the type of *Scopula* Schr. Pure shining white. Forewing with first line very weak and slender, but not infrequently marked with distinct dark dots on the veins; median shade of both wings pale brownish, undulate, often obsolete, on the forewing usually marked by a distinct brown costal spot, though seldom so conspicuous as that of *decorata*; postmedian line blackish, strongly bent outwards near the costa and between the third radial and second median; distal area mostly bluish grey, with a white spot at apex and wavy white subterminal line, and containing two brown patches which fill up the inward curves of the postmedian line. Cell-spot of forewing often absent, that of hindwing always present, though variable in size. Underside of forewing usually infuscated in basal half, cell-spot distinct; both wings with median and postmedian lines present, the distal shading browner and more uniform than above; specimens with paler, weakly marked underside also occur. The distal marginal line, both above and especially beneath, is generally almost continuous, or only narrowly interrupted at the vein-ends; in its anterior part, particularly on the forewing, it is usually more or less enlarged into, or accompanied by, interneural black spots. The fringes are dark-marked, that of the hindwing usually with distinct blackish dots opposite the vein-ends. The distal margin of the hindwing is markedly crenulate, with a slightly stronger tooth at the third radial and a well-marked excision between this and the first radial. ♂ antenna with rather long fascicles of cilia; hindtibia thickened, tarsus a little abbreviated. The egg is somewhat sugar-loaf shaped, laid upright on its narrower end, the upper (micropylar) end truncate; ribbed longitudinally and more slenderly transversely. The larva is slender, though less extremely than most of the genus, the skin rugose; dorsal line fine and interrupted, white, dark edged, dorsal area otherwise reddish brown or ochreous brown, with dark subdorsal line; first to fifth abdominal segments with pairs of V-shaped dark dorsal markings, their points directed to each extremity of the segment, or sometimes merely each with 5 dark dots on each side. Feeds on thyme, but will — at least in captivity — accept also other Labiatae. The pupa is brown with green wing-cases. There are two broods of the moth, one in May and June, the second about August. It frequents dry, chalky hill-sides, usually settling on the ground, and does not fly far when disturbed. In some districts, however (e. g. Bucovina) it is recorded from damp places with *Juncus*, etc. Widely distributed, though not extending very far north; Europe, N. Africa, Asia Minor, Central Asia and Amurland. — **subornata** *subsp. nov.* differs in having the inner and median lines *subornata*, better developed, the latter rather thick, and in the more uniform distal area of both wings, which is almost equally tinged with brownish smoky throughout, excepting the white subterminal line, and lacks the characteristic brown blotches. The postmedian line also is more uniform in colour; in *ornata* it is alternately black and brown. Japan: Oiwake, Yokohama.

A. kashmirensis Moore. Similar to *ornata*, but the distal margin of the hindwing is scarcely excised *kashmirensis* between the radials. The inner and median lines are well developed, as in *subornata*, the postmedian is rather strongly dentate, with a well-marked bidentate distal projection near the costal margin, but scarcely projecting distally between the third radial and second median. The distal shading, as in *subornata*, is rather uniform in tone, the subterminal line broad, sometimes only very weakly lunulate. Fringes weakly marked. Distributed in N. W. India.

A. congruata Z. (3 m) is still more nearly like *ornata* in the weakness of the inner and median lines, *congruata*, and has quite the pure shining white ground-colour of that species. The shape of the hindwing, however, is that of *kashmirensis*, while the scheme of markings is rather that of *decorata*. The ♂ antennal ciliation,

too, though apparently not quite so short as in *decorata*, is distinctly shorter and less dense than in *ornata*. The ♂ hindtarsus is not abbreviated. The blue-grey, wedge-shaped spots at the costal end of the distal band distinguish it at once from *ornata*. The postmedian line of the hindwing is as a rule less strongly bent than in either *ornata* or *decorata*; the strength of the dark markings distally to it is very variable, but almost always less than in any *decorata*; the subterminal line of both wings is rather broad; fringes not strongly dark marked. Under surface of forewing with a rather noticeable dark band proximally to the pale subterminal, which is not distinctly bounded distally. Only known from Sicily. There are two, or perhaps three broods during the summer, the first-brood specimens being the largest and most strongly marked. It flies among thyme and its habits are similar to those of *ornata* and *decorata*.

A. *decorata* is in its typical forms a very pretty species and easily distinguished from the three preceding by its more yellowish-white ground colour (becoming still yellower in the Corsican race) and by the intensity of its dark markings. It is, however, subject to a wide range of variation, both geographical and individual, and its whitest forms are exceedingly similar to *ornata* and *congruata*, especially the latter, which may even be, as ZELLER suggested, an extreme development of it (certainly not of *ornata*, which STAUDINGER suggests as an alternative possibility). *decorata* agrees in shape with *ornata*. It is best distinguished by the shorter, less fasciculate ciliations of the ♂ antenna, the somewhat longer hindtarsus, distinct costal spots on the forewing at the origin of the three lines, the more strongly dentate postmedian line and the presence (even in the light specimens) of some darker shading between the postmedian and subterminal lines of the forewing, especially the blue-grey marks near the costal margin, referred to under *congruata*. In addition there is usually a distinct dark cell-dot present in the fore- as well as on the hindwing, although as it is commonly placed on the median line it is not so conspicuous as would otherwise be the case. The inner line of the forewing is usually distinct in its posterior part, sharply angled on the 2. submedian. The fringes, except in the very light forms, are rather strongly darkened; the dark dots at the vein-ends, when conspicuous at all, are more prolonged into streaks, and less black, than those of *ornata*. As with *congruata*, the dark distal colouring of the hindwing is rather uniform, either strong throughout or weak throughout, not so much broken into blotches as is frequently the case in *ornata* and *subtilata*. The suffusion on the under surface is slightly browner in *decorata*, greyer in *ornata*. The egg is laid upright and is tall, conical, the surface shiny, the longitudinal ribs well developed, the transverse ones faint and numerous; when first laid it is of a pale green colour. The larva is elongate cylindrical, yellow, dorsally reddish, with a double black dorsal line and a very broad blackish subdorsal line, laterally not carinated, a broad white lateral stripe. It feeds on thyme. The pupa has the wing-cases apple green, the abdominal segments reddish. The moth appears in about 18–20 days. It is double-brooded, probably in the south triple-brooded. It frequents dry places where thyme is growing.

decorata. — ***decorata* Schiff.** (= *cinerata* F. = *ornataria* part. Esp.) (4 m) is the most widely distributed European form. The ground-colour is yellowish white, or sometimes purer white, the distal band strongly dark, at least on the forewing, but not very broad, its colour bluish grey. The whiter, more *ornata*-like forms seem to be commonest in Spain and perhaps constitute a local race there. STAUDINGER indicates a very extensive range for typical *decorata*, embracing Central and Southern Europe, North Africa, Asia Minor, Zerafshan to the Ili district and Northern Mongolia. — ab. ***aequata* Stgr.** is described as having the entire row of dark markings on both wings distally to the postmedian line uniformly dark brown (blackish) instead of mainly (on the hindwing entirely) blue-grey as in the type. It is reported from Spain, N. Germany, Asia Minor and the Kentei Mountains. — ab. ***magna* ab. nov.** Under the designation of "*decorata* var. *magna*" I have received a very large ♂ from Konia, Syria, and there are two quite similar ♂♂ in the British Museum collection (S. France and Sarcpta). It is of the purest white form, the dark spots on the costal margin not more strongly expressed than in the best-marked *ornata*, the bluish-grey distal costal spot also wanting, the next spot in the series almost as weak as in *ornata*, but more blue-grey (less brown). The cell-spot is present on the forewing and a series of blue-grey spots between the subterminal line and the distal margin of both wings is quite characteristic of *decorata*. — ***violata* Thnb.** (= *caerulata* Gmel.) is the form which occurs in Sweden and European Russia, but also occasionally as an aberration elsewhere. It is said to have the distal area more broadly and more darkly banded with blue-grey. I have seen no examples, but some from other parts of Europe approach it. — ***honestata* Mab.** (3 m) from Corsica and Sardinia is an interesting form of a more strongly yellowish tone. In the few specimens which I have seen the black discal spots of both wings are enlarged, the inner line of the forewing is well developed, rather thickened, especially at the costal and posterior margins, and the postmedian line of both wings is more deeply indented between the radials than is usual in the typical form, although individual specimens of the latter have this same form of postmedian. Distributed in the mountains, June and July.

subtilata. **A. *subtilata* Chr.** (4 m). Variable in size, but perhaps larger on an average than *ornata* and *decorata*, though not so large as ab. *magna*. Forewing with costal margin rather straighter; hindwing with distal margin crenulate, the tail at the third radial noticeable, but the excision between the radials very shallow. Colour

and markings nearly as in *decorata*, but the median line thicker, at least at the margins, forming on the costal margin of the forewing a broad fuscous blotch, which touches or absorbs the discal spot. Subterminal white line broad, the band which precedes it darker than in *ornata*, but more variegated than in most *decorata*, the spots between the third radial and second median being rather pale and blue-greyish (and rather markedly displaced distally, on account of the strong projection of the postmedian line), while the other spots are darker and browner. Hindwing more weakly marked, though not always quite so weakly as in the figured example. The ♂ hindtibia is not thickened and the tarsus not shortened; I find, too late to rearrange my manuscript, that the former is provided with a pair of spurs, so that the species should rightly have been placed in the section *Pylarge* — a further indication of the artificiality of that division. *subtilata* occurs in South Russia (Sarepta) and Transcaucasia and is double brooded, flying in May—June and August—September. The larva is apparently unknown. VON GUMPPENBERG ignorantly refers *subtilata* as a “var.” to *decorata* and following it immediately by a description of the larva of the latter has misled HOFMANN into quoting that description under *subtilata*.

A. arcuaria Hbn., figured without description (Geom. fig. 137), has remained a puzzle to systematists, *arcuaria*. and I am inclined to suspect it is an exotic species — perhaps a large aberration or close ally of the North American *lautaria* Hbn. — introduced as European by mistake. According to a manuscript note of DONZEL’S, however (quoted by MILLIÈRE), it came from Italy, and it is therefore desirable to mention it here, as it should belong (except for its narrower wings) to the *ornata*-group, possibly an aberration of *congruata* Z. Guenée thought it might belong to *decorata* Schiff., but the figure shows the distal margin of the hindwing entire, not excised. The antemedian and postmedian brown lines are well developed, the latter on the forewing strongly incurved posteriorly, but not dentate, the median is entirely wanting. The dark distal shading is restricted on both wings; that of the forewing all blue-grey, consisting of a pair of spots between the radials and a small blotch near the posterior margin, both followed distally by a transverse streak; that of the hindwing consisting of radial and inner-marginal blue-grey streaks followed distally by brown ones. The size is about that of *satsumaria* or small *congruata*. I find that HÜBNER himself, in erecting his *lautaria* in 1825, says that it is “nearest to *arcuaria*”. In any case a suggestion of HERRICH-SCHÄFFER’S, that it may be compared, except in size, with *favillacearia* Hbn. (*fagaria* Thnb. var.) may be set aside as entirely misleading.

A. irrorata Baker (5 d). Following STAUDINGER’S arrangement I leave this species at the end of the *irrorata*. genus, but it has no connection with the *ornata*-group. Probably he was unacquainted with this and two other Madeiran species (a *Ptychopoda* and a *Cosymbia*) which he places here. I have not, however, been able to satisfy myself as to its nearest affinities, unless possibly it is related to *guancharia* Alph. I know only the ♂, but the neururation shows that it cannot be a *Ptychopoda*, with which otherwise the wing-form might associate it. Narrower-winged than most *Acidalia*, the hindwing with distal margin waved, very weakly angled at the third radial. Ochreous or rufous-ochreous, the ground-colour about as in *Ptychopoda rufaria*, but looking rougher-scaled on account of a dense though fine irroration of reddish brown scales. The lines exceedingly weak, approximately parallel with the distal margin or slightly more oblique; median shade a little thickened, slightly incurved in posterior part; postmedian line rather near the distal margin, appearing somewhat dentate; subterminal very faintly indicated by some macular shading proximally and distally to it. Forewing with a very small black discal dot, hindwing with a rather larger and stronger one. Forewing beneath without first line, the postmedian rather better expressed than above, markedly dentate; hindwing almost without markings, the discal spot reduced. ♂ antenna with strong fascicles of very long cilia. Hindtibia not dilated, tarsus as long as tibia. Madeira. Two specimens before me are smaller and more brightly coloured than the figured type.

The following species is unknown to me and will possibly prove to be a *Ptychopoda*. GUENÉE, to whom it was also unknown in nature, suggested that it might possibly be related to *Ptychopoda seriata* Schr. (= *incanaria* Hbn.) or that it might, on the other hand, be an exotic species, perhaps near *Pt. ossularia* Hbn. (= *temnaria* Gn. = *terraria* Gn., in err.). It seems to me scarcely possible that it can represent any form of *ochroleucata* H.-Sch., as suggested with a query by STAUDINGER.

A. accessaria H.-Sch. (= *recessaria* Gn.). “Reddish grey about as *rufularia*, with very sharply pointed forewings. All the wings from the base to the straight, finely dentate median shade darker, though towards the base less strongly so, without trace of the first line, the hindwings with black central dot; the postmedian line likewise almost parallel to the distal margin, finely and sharply dentate, thick; the light subterminal fine and sharp, dark-shaded on both sides. The terminal line thick and black, finely interrupted at the veins, the fringes unmarked. Each joint of the antenna on each side with two pencils of different

lengths. A ♂ from Herr KADEN without locality". The figure shows the median shade, especially on the forewing, thick and dark.

13. Genus: **Glossotrophia** *gen. nov.*

Face smooth, broad. Palpus in both sexes short, terminal joint distinct. Tongue long, in most species extraordinarily elongate. Antenna in ♂ with rather long fascicles of cilia. Hindtibia of ♂ not thickened, typically with a single spur (in *diffinaria* without spurs, in *fucata* and *eurata* with two), in ♀ with two spurs; hindtarsus in both sexes long. Neuration as in *Acidalia*.

Type of the genus: *confinaria* H.-Sch. (*Acidalia*).

The early stages, so far as is known, are similar to those of *Acidalia*. But the pupa, in all the species with the extraordinarily long tongue, shows a remarkable adaptation to accommodate this organ. The tongue-case stands out free and after extending some distance beyond the anal extremity of the pupa curves in a wide sweep dorsad and extends over the back of the pupa nearly as far as to the thorax. The larvae are for the most part attached to Caryophyllaceae (*Dianthus*, *Silene*, etc.) and the moths, like those of the Noctuid genus *Dianthoecia*, are no doubt adapted for fertilizing these flowers.

Apart from the abnormal tongue-structure, which is not absolutely invariable, the erection of this genus is necessitated by the absence of the middle pair of spurs in the ♀. A study of *Acidalia* from all parts of the world has shown that the spurs of the ♀ can be relied upon. From *Ptychopoda*, which also possess 2-spurred ♀♀, *Glossotrophia* is abundantly distinct in the elongate larvae, the neuration of the hindwing (the second subcostal not being stalked) and many other characters. It is evidently derived from *Acidalia*, and indeed from forms such as *coenosaria* or *submutata*; like the latter, it has a fine black line extending round the apex of the forewing.

The geographical range of *Glossotrophia* is apparently restricted to the southern part of the Western Palearctic Region and N. W. India.

confinaria.

G. confinaria H.-Sch. (4 i, ♂ as *confinaria*, ♀ as *coenosaria*). Very variable in colour, according to the nature of the rocks on which it rests. The typical form is cinereous, usually with a faint tinge of yellowish. The lines are rather thick, especially the median, but are not usually very intense; they arise from three (usually equidistant) dark costal spots. As usual, only two of these lines are present on the hindwing; but these appear as continuations of the first and second, not (as in the similar species of *Acidalia*) of the second and third. Dark discal spots are present, but not very intense. The pale subterminal line is formed nearly as in *A. marginepunctata*, being strongly swollen between the radials and near the posterior margin and lunulate between. Distal marginal line black, very slender and interrupted, anteriorly somewhat thickened between the veins, but never forming definite black dots. Under surface very glossy, without markings or with a very faint postmedian line present on the forewing or on both wings; the forewing usually also with faint traces of the second and third dark costal spots of the upperside; hindwing more whitish than forewing. Tongue extremely long. ♂ antennal shaft thick, the ends of the joints somewhat projecting, the fascicles of cilia very strong; hindtibia with a single spur. — ab. **falsaria** H.-Sch. (= *luridata* Rbl. nec Z.) (4 h) is a very much darker form, of a deep brown-grey colour, occurring with the type-form in some localities but replacing it in others. Our figure is not dark enough. PÜNGELER has pointed out that it is not quite certain that *falsaria* is the correct name for the form which is ordinarily so designated; for HERRICH-SCHÄFFER figured a specimen from the Caucasus and it is not yet proved that the well-known form of Central Europe occurs there. — ab. **arenacea** ab. nov. represents the other principal phase of colour variation, in which the yellower scales predominate, giving to the insect a strongly sandy tone. — ab. **extenuata** ab. nov. is a very small, grey, weakly-marked form which may occur sometimes with the type but which deserves attention on account of its tending to form a local race on the Island of Capri, whence I have seen it in numbers. — **sacraria** BANG-HAAS (3 l, as *confinaria*) is an interesting local race or closely allied species from Uralsk, distinguishable at once by the white ground-colour, absence of the dark median shade of the forewing and reduction or absence of the cell-spots. The structure appears to agree entirely with that of *confinaria* unless possibly the antennal joints in the ♂ are slightly less swollen. — The larva of *confinaria* is long and slender, without sharp lateral carination; the dorsal line is very fine and pale, a little more distinct on the thoracic segments and the last three abdominals; there is a rather intricate dark dorsal pattern. The ground-colour is in general lighter or darker grey. It feeds on *Silene inflata*. It has been correctly described by REBEL; MILLIÈRE's figures and description can scarcely belong to this species. The moth appears in June, July and August and is widely distributed in Southern and Southern Central Europe. It is said to occur also in Transcaucasia and a variety in the Brussa district. The small form *extenuata*, Herr PÜNGELER informs me, occurs in Central Italy together with *romanaria* Mill. which is similar in size but always reddish and distinguishable by the less long tongue.

G. diffinaria *nom. nov.* (= *luridata* Stgr. nec Z.) (4 h, as *luridata*) represents *confinaria* in Asia Minor, *diffinaria*. and also, according to STAUDINGER, in Syria. From certain grey forms of *confinaria* with a little admixture of yellowish, it appears to be superficially indistinguishable; indeed the resemblance is so exact that STAUDINGER records *diffinaria* as occurring among *confinaria* ab. *falsaria* in the Tyrol, which is not really the case. The essential distinction of *diffinaria* lies in the absence of the ♂ hindtibial spur. Except in size, there does not seem to be much variation; our figure is rather more strongly marked than is usual. I have already, in dealing with the true *luridata*, explained the necessity for renaming this species.

G. eurata *sp. nov.* is very similar to the light sandy forms of *confinaria*, but differs in the structure *eurata*. of the ♂. The hindtibia in both sexes bears a pair of spurs. The ♂ antennal structure is very similar to that of *confinaria*, although the joints appear to be slightly more angularly projecting and the ciliation perhaps slightly stronger. Whitish sand-colour, the darker dusting fine, but moderately strong. The lines of the forewing start from fuscous or blackish costal spots; the apex of the forewing shows a tendency to become pale, as is more characteristic of *rufomixtata* and *romanaria* than of *confinaria*. The second line of the hindwing is removed further from the discal spot than in *confinaria*, arising between the end of the median and the postmedian of the forewing. The latter on the forewing is rather more conspicuously dark-spotted on the veins. The discal spots are more prominent than is usual in *confinaria*. Described from a ♂ and ♀ in the PÜNGELER collection, the former (the type of the species) from Arwas, near Askhabad, 12 May 1900, the latter from Schahkuh, Persia. The ♂ is of about the size and shape of *fucata*, from which it is easily distinguished by its coloration, scaling and antennal structure. The ♀ is much larger, about as the larger forms of *confinaria*, and the forewing appears somewhat broader, but there seems no reason to doubt the specific identity. Similarly coloured examples of *romanaria* Mill. are easily distinguished by the scaling, as well as the structure.

G. rufomixtata Rbr. (7 c) was formerly regarded as another variety of *diffinaria* and *confinaria*, with *rufomix-* which it agrees in the extremely long tongue; but apart from differences in the coloration, which is usually *tata*. strongly mixed with reddish or bright ochreous, the ground-colour remaining at the same time white or bluish white, very strongly powdered with dark grey, it shows a very distinctive character in the nature of the scaling, as has been pointed out by PÜNGELER. The scales in the dark spots which accompany the subterminal line are arranged in very fine transverse rows, so that when examined with a lens the spots appear fluted; in *confinaria*, *diffinaria* and *eurata* the dark scales are evenly distributed. The forewing shows a more conspicuous pale, usually subquadrate apical spot than in those species. The ♂ hindtibia, as in *confinaria* is furnished with a single spur. The larva was discovered by GRASLIN, feeding on *Dianthus pungenis*. It is very similar to that of *confinaria* but with a darker and narrower dorsal band. GRASLIN was the first to observe the remarkable conformation of the pupal tongue, described in our generic diagnosis. *rufomixtata* is distributed in Spain, Portugal, Southern France and perhaps N. Africa, and is also recorded from Teneriffe. — ab. *dentatolineata* *dentato-* Rbr. is a less variegated, less heavily blackish-dusted form, with the dark lines in consequence standing out more *lineata*. distinctly and showing up their dentate character more prominently, although their course is not in reality essentially different from that shown in the type form. The ground colour in RAMBUR's figure is light brown. Figured without description from Andalusia. Referred to the present species by STAUDINGER and probably correctly, although the inadequate and even inaccurate way in which he has dealt with this group of species prevents our giving any weight to his decisions. The only specimen which I have seen agreeing with the figure is a ♀ from the mountains of Cyprus, which I suppose really belongs to *rufomixtata* although its appearance would suggest yet another species, nearest to *romanaria semitata*, but rather darker and with the extremely long tongue, the scaling as in *rufomixtata*.

G. rufotinctata *sp. nov.* Similarly coloured to the reddish forms of *rufomixtata*, but more uniformly, *rufotinctata*. no part of the ground-colour (or only the extreme base of the hindwing) remaining white, while the dark dusting is less intense and more reddish. The face appears rather browner (less blackish). The wings are rather longer and narrower, but the shape is somewhat variable, one example more nearly approaching *rufomixtata* than the other. The first line projects less behind the cell than in *rufomixtata*. The postmedian line of the forewing, which in all the *rufomixtata* that I have seen forms a marked proximally-directed tooth on the fourth subcostal, runs in *rufotinctata* straight until the bend at the first radial. The apex of the forewing is less distinctly light than in *rufomixtata*. The discal spot of the hindwing is small (in *rufomixtata* larger). The under surface is entirely without markings and shows a tinge of flesh-colour, becoming whiter posteriorly on both wings. But the chief difference is in the structure of the ♂ antenna; the joints have not the projecting edges which are so marked in the preceding species. The tongue is perhaps a little less extremely long, but I have been unable to make any exact measurements. It is certainly elongate. Hindleg and subterminal scaling about as in *rufomixtata*. Aksu, E. Turkestan, 2 ♂♂ in the PÜNGELER collection.

romanaria.

G. romanaria Mill. (31) is apparently a variable species, and has been much confused with the allied species, in particular *rufomixtata*. The scaling of the dark patches is arranged as in that species, but the fluted appearance even more pronounced. That it cannot, however, be a form of *rufomixtata* is proved by the tongue and by the early stages, as has been pointed out by REBEL. The tongue, although long, has not nearly the abnormal length which it attains in that species. I have had no material in undoubted *romanaria* for measuring, and it is impossible to estimate the length when it is rolled up; but in an example of the Syrian subspecies (or close ally) *semitata* of which I relaxed and extended the tongue I found it 11—12 mm long. It looks less in the type-form, and indeed must be so if MILLIÈRE's figure of the pupa is correct; for that figure shows no elongate tongue-sheath. The tongue of *confinaria*, it may be added, measures about 18 mm, but freshly killed examples are needed for accurate work at this question. *G. romanaria* is generally of small size, in its typical forms rather glossy, the dark dusting not being strong enough to give the wings a more roughened appearance. The shades of colour are soft and delicate but sometimes rather bright, as there is often a strong tinge of pinkish or light red; the costal spots and the lines are brown, sometimes with a decided olivaceous tinge; the shades before the subterminal line greyer. The pale apical patch of the forewing is usually rather conspicuous, except in the lightest forms. The postmedian line is not appreciably toothed near the costal margin. Underside almost entirely without markings. In the ♂ antenna and hindleg I find nothing distinctive from *confinaria* or *rufomixtata*. The larva feeds on the leaves of *Linaria* and *Antirrhinum*. It resembles that of *Acidalia marginepunctata*. Elongate, cylindrical, without lateral flange. Head small. Body fleshy grey, sometimes more clay-coloured, ventrally whitish; dorsal line fine, double, brown; tubercles and stigmata black. The moth is double-brooded, appearing in the spring and in July. True *romanaria* (which according to MILLIÈRE varies little) occurs in Central and Southern Italy, Sicily and Tunis; probably also in Spain and Algeria, but there is still much work to be done in arranging and classifying the closely allied

philipparia.

forms. I only indicate one or two which I have been able to examine. — **philipparia** subsp. nov. is a much darker form from Philippeville, Algeria. Reddish brown, about as in our figure of *falsaria* (4 h) the lines and subterminal shades darker brown, all showing very strongly, with the lens, the fine transverse striation. The pale apical spot on forewing and a pale line at base of fringe on both wings, though not really lighter than in typical *romanaria*, are more conspicuous on account of the darkening of the ground-colour. ♂♀ in the PÜNGELER collection, bred ab ovo by K. ANDREAS in September, 1910. The larvae fed on Caryophyllaceae. I have a larger and lighter ♀ (the dark lines and cell-spots consequently showing up more distinctly) from the same locality, taken in May 1909, which is still a good deal darker than typical *romanaria*. It is however, possible that larger material will show *philipparia* to be merely an extreme aberration. It is perhaps the N. African form indicated by STAUDINGER under *rufomixtata* as a transitional form to *diffinaria*; but it has not the

semitata.

coarse dark speckling of the former, and differs from both in the shorter tongue. — **semitata** subsp. nov. represents *romanaria* in Syria. It was formerly recorded by PÜNGELER as a small light form of *rufomixtata*, but he now determines it (in litt.) as "*romanaria*?". I suspect it will prove to be a species distinct from both, and indeed intermediate. The tongue seems to be longer than in typical *romanaria*. The antennal ciliation appears appreciably shorter, though similarly arranged. The ground-colour is of a very pale sandy hue, slightly tinged with reddish, very similar in colouring to *coenosaria* from the same locality; in some specimens the colouring is a little deeper, in others a little paler, but it does not seem very variable. It looks less glossy than typical *romanaria*, the wings being more strongly dusted with dark scales; but these are reddish brown, not so blackish nor so coarse as in *rufomixtata*. The costal spots of the forewing are as a rule strongly developed, that at the origin of the postmedian line black, or almost black. The average size is at least as small as in *romanaria*, perhaps slightly smaller. The type specimen, from Baalbek, is in my collection, and was taken by Mr. P. P. GRAVES at light in May 1905. I have also a second ♂ with the same data, and a series of both sexes from "Syria" without more exact locality, Herr PÜNGELER has others and there is one in the British Museum from the LEECH collection.

isabellaria.

G. isabellaria Mill. (7c) is not certainly known to me, but I have no doubt it belongs in the immediate vicinity of *romanaria*. To judge from some specimens similar in coloration to MILLIÈRE's figures I should be inclined to suppose that it was only a richly-coloured Spanish form of that species. But it must not be forgotten that MILLIÈRE, who knew the larvae, regarded the two as distinct species and it is possible that *isabellaria* is a scarce species awaiting rediscovery. The form from Spain and Portugal which I provisionally refer here shows one slight structural difference which should be at least subspecific; the ♂ antennal joints seem to project still more strongly. The ground-colour is reddish, the markings brown with a rather strong shade of olive, the dark dusting stronger than in *romanaria* but scarcely so strong as in *rufomixtata*; the striated scaling of the dark outer shade as in those species. The pale subterminal line is conspicuous and thickens considerably between the radials and near the anal angle, about as in *Acidalia marginepunctata*; the distal shading beyond the subterminal line is so slight that the subterminal itself almost appears to be extended as far as to the black terminal marks. The dark lines are rather thick and not very sharply expressed. The wings seem sometimes rather broader. MILLIÈRE in erecting his *isabellaria* speaks of the "feebly pectinate

antenna", but this can scarcely refer to anything more than the strongly projecting joints or serrations, and would help to strengthen our identification. The larva, as described and figured by the same author, would appear to be very similar to that of *romanaria* but with the dorsal area more tinged with vinous, the ventral with bluish, the brown dorsal line ill-defined except on the last three segments. It was fed, in captivity, on various plants, of which it seemed to prefer the flowers of *Alyssum maritimum*. Described from Western Spain. The specimens before me are from Portugal and Southern Spain. Should it prove necessary to unite this species with *romanaria*, *isabellaria* will be its oldest name.

G. fucata Püng. (31) differs from nearly all the other forms of *Glossotrophia* in the more pointed forewing, *fucata*, its distal margin being decidedly more oblique, and in the presence of a pair of strong spurs on the ♂ hind-tibia. In these respects it agrees only with the much paler, greyer *eurata* Prout; see above for the differentiation. *G. fucata* shows the smooth appearance of *romanaria*, not being strongly dark dusted. Its coloration is also similar to that of the rather reddish forms of *romanaria*. The first line, which in *romanaria* and *rufomixtata* generally shows a marked projection behind the cell, is in *fucata* gently incurved in its posterior part. The postmedian line is rather further from the distal margin, the grey band between it and the (strongly dentate) subterminal line therefore broader; it is also in the type specimen stronger, but this may prove variable. The arrangement of the dark scales on this band is scarcely so definite as in *rufomixtata*, certainly not so marked as in *romanaria*. The interrupted black marginal line is immediately preceded by a very fine white line, while in *romanaria* (see the subspecies *philipparia*) the pale line follows the black marginal line. ♂ antennal ciliation moderately strong, but the joints of the antenna not appreciably projecting. Described from a single ♂ from the Alexander Mountains, Central Asia. The author writes me that he has since seen a ♀ in the HOMBERG collection, larger but otherwise entirely agreeing.

14. Genus: **Holaretias** gen. nov.

Face flat. Eye small. Palpus moderately long, with fine, long projecting hairs below, terminal joint pointed. Tongue developed. Antenna in ♂ with fascicles of moderately long cilia; in ♀ simple. Pectus and femora hairy. Hindtibia in ♂ with two, in ♀ with four spurs. Neuration as in *Acidalia*.

Unless it has any further representatives among the North American species which I have not yet studied, this genus contains only a single species. It has been referred to *Acidalia*, but the head and leg structure differentiate it very strongly even from the section *Pylarge*, with which it agrees in the number of hind-tibial spurs. This and the two genera which follow are perhaps really more ancestral than *Acidalia*, but they seem to fall appropriately enough between that genus and *Emmiltis*.

Holaretias, with its hairy clothing, is well protected against the Arctic cold and reaches high latitudes and altitudes. Like some other inhabitants of the far North, it is common to the Palearctic and Nearctic Regions.

Type of the genus: *sentinaria* Hbn.-Geyer (*Haematopis*).

H. sentinaria Hbn.-Geyer (= *spuriaria* Chr. = *gracilior* Btl.) (4 i, erroneously called *frigidaria*). Bright, *sentinaria*, deep reddish fulvous, more or less strongly suffused with dark fuscous, at least in the basal area of the hindwing; most commonly the distal half of the forewing and to a less degree of the hindwing remains nearly free from suffusion, but sometimes the clear coloration is restricted to a narrow area between the median and postmedian lines. Lines dark fuscous; first line of forewing bent near the costal margin, approaching the median line posteriorly, very frequently altogether lost in the dark suffusion; median line rather thick; postmedian only slightly sinuous. Cell-spots usually obsolescent. Fringes flushed with vinous. Under surface clearer fulvous, usually without dark suffusion, the darkest specimens, however, suffused from the base to the median line; median and postmedian lines, and usually the discal spots, sharply defined; sometimes there are traces of the first line in the posterior part of the forewing. A very easily recognized species, in spite of its variability in coloration. The type form, so far as I know, does not occur in the Palearctic Region, but inhabits Labrador and the Rocky Mountains of Canada and Colorado. As it was the only form available for figuring, and STAUDINGER has reckoned Labrador to the Palearctic Region we represent it here. — **rufociliaria** Brem. *rufociliaria*. (= *rufularia* Ev. nec H.-Sch. = *rufinaria* Stgr.) is on an average decidedly larger, the colour is brighter (almost as in *Ptychopoda serpentata* Hufn.), the lines and discal spots of the upper surface more distinct, as there is either no dark suffusion or at most some suffusion (not very intense) in the basal part of the wings. Distributed in Siberia. I have seen specimens from Amurland and the Kentei Mountains. According to STAUDINGER the examples from N. E. Siberia are smaller, in this respect approaching the American type. — **rufinularia** Stgr. from the highest altitudes in the Sajan district, is unknown to me in nature. It is also smaller

than normal *rufociliaria* but is more reddish and characterized particularly by the blackish veins, which, together with the strongly expressed blackish lines, give it an almost latticed appearance.

15. Genus: **Oar** *gen. nov.*

Face rough-scaled. Eye small. Palpus moderate, with long hairs projecting forwards and downwards. Tongue rudimentary. Antenna in ♂ with slender, strongly ciliated pectinations; in ♀ simple. Femora somewhat hairy or in ♀ nearly glabrous. Hindtibia in ♂ with two, in ♀ with four spurs. Forewing rather short and broad, neurulation nearly as in *Acidalia*. Hindwing with second subcostal arising from apex of cell or shortly stalked.

This genus, which was merged by STAUDINGER in *Fidonia* (!) has much affinity with *Emmiltis*. MEYRICK, indeed, did not distinguish it therefrom, having evidently only the ♂ before him. The ♀ of *Emmiltis* has only two spurs on the hindtibia. The other differences are for the most part less essential. In order to differentiate the ♂, however, it is only necessary to point out that the palpus of *Emmiltis* is much less abnormal and that in it the ♂ antennal pectinations do not, as is the case in *Oar*, terminate in strong, spreading cilia. From *Holarctias* the present genus differs in the pectinate ♂ antenna, rudimentary tongue, less hairy legs and different wing-form and markings.

Type of the genus: *pratana* F. (*Phalaena*).

The geographical range is restricted to Southern Spain, N. Africa, Palestine and the shores of the Red Sea. All the known forms seem to me to be probably referable to a single variable species.

pratana. **O. pratana** F. (= *pratanaria* Turton = *reaumuraria* Mill. = *megearia* Ob. = *ectypata* Mab.) (7c) was first described from N. Africa as long ago as 1794. Whitish, more or less suffused with light ochreous brown, and with some scattered dark speckling. Lines dark brown or blackish. First line of forewing twice dentate outwards, rather thick, especially at the teeth, sometimes almost interrupted between them. Postmedian line somewhat dentate, incurved between the radials and again posteriorly, followed by a white line. At about 1 mm proximally to the postmedian a line following the same course, the space between them sometimes darkened. Subterminal line whitish, placed near the distal margin, following a similar course to the postmedian, accompanied proximally by some dark shading, which is usually broadest and strongest anteriorly; the space between this line and the margin also as a rule more or less darkened. Cell-spot present, either well within the central area or touching the proximal postmedian line; in the latter case scarcely noticeable. Fringes chequered. Hindwing without the first line; the proximal postmedian line often and the distal sometimes weak. Under surface more weakly marked, the postmedian line, the white line which follows it and the white subterminal usually fairly distinct. Andalusia, Murcia and Algeria, end of January to April and again in June. The darkest Algerian specimen which I have seen is indistinguishable from some forms from the Red Sea; the lightest is a ♀, almost white with only a very slight ochreous tinge. — *obscuraria* Baker (= *nigrescens* Hampson.) is decidedly darker, sometimes blackish, and is the prevailing form in Egypt, the Sudan and at Aden, December to March. Examples occur in these localities, however, which are as brownish and almost as light as the name-type, while on the other hand this dark form, according to STAUDINGER, occurs as an aberration in Murcia. — *mortuaria* Stgr. represents the species in Palestine and is on the whole slightly less dark than the form *obscuraria*, while it differs from the type in lacking the ochreous tone. The prevailing shade is greyish or cinereous. STAUDINGER says it is also smaller than the other forms, but the few examples which I have seen do not bear this out. — Egg an irregular ellipsoid, the surface covered with polygonal reticulation arranged in longitudinal lines so as to form channels with prominent edges; yellowish green. Larva elongate, subcylindrical, the last 3 segments strongly thickened, tapering a little anteriorly; segment-incisions not distinct; green with yellow dorsal and lateral stripes; a single more or less rounded dark brown spot on the side of the 6. abdominal above the spiracle (rare aberrations have similar spots also on the first five abdominals); tubercles indistinct. Apparently not yet observed at large; in captivity, among many plants which were offered, the larvae chose *Suaeda vermiculata*, a plant which at Biskra is as abundant as the moth. Pupa short, much attenuated posteriorly, somewhat granulated dorsally, the wings smooth; yellowish brown, the spiracles small, not very distinct; cremaster bearing two erect bristles, their extremity forming a small hook. From eggs laid 10 May the larvae pupated in the middle of June. There seems to be a succession of broods at least until June, perhaps later.

16. Genus: **Stigma** Alph.

Face smooth. Palpus moderate, with strong projecting hairs. Tongue short and slender. Antenna in ♂

with very short pectinations, bearing fascicles of cilia. Hindtibia in ♂ with two spurs. Abdomen in ♂ rather long and pointed. Forewing with costal margin arched, distal margin very little oblique, neurulation about as in *Acidalia*. Hindwing relatively rather large, costal vein anastomosing as usual near base, but thence only gradually or quite moderately diverging; second subcostal from angle of cell or very shortly stalked.

Probably nearest to *Oar*, notwithstanding the difference in shape and markings. The ♀ is excessively scarce, and imperfectly known. The only two of which I have any knowledge are in the PÜNGELER collection and very unfortunately both have the hindlegs lost or damaged. I conjecture that she will have four spurs. But even in that case the less abnormal palpus will help to distinguish the genus from *Oar*. The ♀ is smaller than the ♂, with narrower, more pointed wings and probably flies but little.

Of this genus also only a single variable species is known. It inhabits the mountains of Central Asia. A species from Panama, described by THIERRY-MIEG as *Stigma isthmensis*, is unknown to me, but will without doubt prove to belong to some other genus.

S. kulschaensis *Alph.* (5 g) cannot possibly be mistaken for any other known species. The wings *kulschaensis* both above and below are brownish black with a moderate-sized yellow discal spot. In the ♀ this spot is smaller. Discovered in the neighbourhood of Kuldja and apparently common in the Western Thian-Shan. Flies freely by day, from the end of May onwards. — **negrita** *Th.-Mieg* (= *atraria* *Bang-Haas*) is evidently *negrita*. only a variety, or possibly aberration of *kulschaensis* and was described as such by *Thierry-Mieg* from Issyk-Kul, while BANG-HAAS, who re-described it a year later, regarded it as a species. It is of a deeper black and lacks the yellow central spot. My single specimen is also a little larger than the type-form, and this is also mentioned in the original description. The only known ♀ has very small yellow spots persisting, so that the distinction seems only to apply absolutely to the ♂♂. The localities known to me are Issyk-Kul and the Alexander Mountains, thus a little further west than the headquarters of the type form.

17. Genus: **Emmiltis** *Hbn.*

Face smooth. Eye small. Palpus rather short, with projecting hairs beneath but these very much more shortly than in *Oar*. Tongue slender. Antenna in ♂ pectinate. Hindtibia in both sexes with a single pair of spurs. Neurulation of forewing as in *Acidalia*. Hindwing with second subcostal stalked.

This and the succeeding genera, like the three which precede, are small Palearctic offshoots of the main *Acidaliid* stock; but they show a higher grade of specialization in the loss of the middle spurs of the ♀. *Emmiltis* may be derived from *Oar*, which it somewhat resembles in shape and pattern, though much inferior in size. The North American species which is referred here by HULST, *sparsaria* *Walk.*, is not congeneric. It is necessary to add that of recent years HÜBNER's name *Emmiltis* has been mis-applied by some systematists, being used in place of *Acidalia* *Tr.* The type of the genus *Emmiltis* is *pygmaearia* *Hbn.*, HERRICH-SCHÄFFER having long ago restricted it to that species.

E. pygmaearia *Hbn.* (= *parvularia* *Hbn.*) (4 a). Brownish grey, sometimes tinged with olivaceous, *pygmaearia*. sometimes more ochreous, the ♀ nearly always less bright than the ♂. Forewing with an undulate white inner line, usually followed in the ♂ by a narrow dark band or thick line; the distal part of this band represents the median shade and is closely followed by the black discal dot; to this follows a less undulate, sometimes nearly straight, fine dark postmedian line, edged distally by a thicker pale line; the pale subterminal line is placed and shaped nearly as in *pratana*, the area between this and the pale postmedian line is moderately dark; the fringe is long, and is traversed by a thick dark line, which is sometimes expanded into spots opposite the ends of the veins. Hindwing similar, without the inner line. Under surface similar. Moderately variable but always unmistakable. The line or band proximally to the postmedian line is always rather pale, sometimes as pale as the line distally to it; in this case the wings present the appearance of being traversed by a moderately broad pale postmedian band, bisected by the fine dark postmedian line. The geographical range of *E. pygmaearia* apparently only extends from Southern Switzerland southwards to Central Italy and south-east to Dalmatia. It is on the wing from the end of May into July. The egg is yellowish, spherical, apparently not fully described. The larva is quite similar to those of *Ptychopoda*, of medium thickness, tapering anteriorly, strongly carinated laterally, the head small, flattened. Blackish, tinged with green; dorsal line fine, pale, not interrupted, edged with brown; subdorsal brown, interrupted; spiracles large and black. Polyphagous, preferring dry leaves.

18. Genus: **Anthometra** *Bdv.*

Agrees closely in structure with *Emmiltis*, to which MEYRICK has sunk it. But even if there were

no other difference, the entirely different shape of the wings would raise a doubt as to the desirability of uniting them. In addition the tongue is stouter, the ♂ antennal pectinations much longer, the costal vein of the hindwing after touching or anastomosing with the subcostal diverges more gradually. The second subcostal of the hindwing is usually long-stalked with the first radial. Both wings are long and narrow, densely scaled. The ♀, as in many *Ptychopoda*, is smaller and narrower-winged than the ♂, which is by no means the case in *Emmiltis*.

Only a single species is known, and this has a very restricted range, being confined to the Pyrenees, Spain and Portugal.

Although MABILLE pointed out the correct systematic position in 1866, all authors excepting MEYRICK have continued to misplace the genus, perhaps on account of its strongly pectinate, almost plumose, ♂ antenna.

plumularia.

A. plumularia Bdv. (= *concoloraria* Led. = *psychinaria* Rosenh.). Variable in colour from reddish ochreous to reddish cinnamon-brown, sometimes very dark. Both wings with dark median and postmedian lines, often weak, sometimes almost obsolete, the postmedian followed by a vague pale line. Underside similar. Pyrenees to Portugal, June and July. The ♂ is active on the wing in sunshine, the ♀ much more sluggish. Flies in bushy places in the mountain valleys and ascends to a height of about 1500 m. It is said to frequent a species of *Genista*.

19. Genus: **Cleta** Dup.

Probably an offshoot of *Emmiltis*, differing in little except the absence of spurs on the ♂ hindtibia, which is clothed with rather long soft hair, in the longer-haired palpus and usually in one peculiarity of neuration, which, though appearing occasionally as an aberration in *Ptychopoda* and perhaps one or two other genera, is here of such frequent occurrence that MEYRICK has even employed it as the principal generic distinction. I have, however, found it inconstant in *ramosaria* and *filacearia*. It consists in the loss of the areole in the forewing, the first subcostal vein, which arises from the cell, failing to touch, sometimes scarcely even approaching the stalk of the other four. *Cleta* is distributed in the southern Palearctic Region from Spain to Central Asia. The type of the genus is *ramosaria* Vill.

ramosaria.

C. ramosaria Vill. (= *vittaria* Hbn. nec Thnbg.). Paler or darker ochreous, the lines fuscous, forewing with three, hindwing with two; base of both wings usually strongly shaded with fuscous; the area distally to the postmedian line of both wings also mostly fuscous, containing a broad, interrupted pale subterminal line, which is usually broken up into an anterior band and a posterior spot; sometimes this pale shade is extended and occupies nearly the whole space between the normal position of the subterminal line and the distal margin. Spain and Morocco; I also have one worn example before me from Biskra, captured with the following.

transiens.

— **transiens** form. nov. (4 a, as *vittaria*) is the prevailing form in Algeria and the only one which I have seen from Palestine. The ground-colour is generally brighter ochreous, the dark basal and distal shading very much weaker, often scarcely differentiated from the ground-colour. In addition I notice that the median line of the forewing in this form is generally midway between the others and is scarcely bent in the middle, while in true *ramosaria* it is generally nearer to the inner line, sinuous and showing a distinct distally-directed tooth in the middle. *transiens* stood in the British Museum collection as a separate, unnamed species and I have recently received it under the trade-name *vittaria* var. *transiens*. I should not be surprised if it proves specifically distinct. I am not acquainted with any account of the early stages of *ramosaria*. The geographical range of the species is restricted, so far as I know, to the countries mentioned above and possibly Sardinia. WERNEBURG pointed out nearly 50 years ago that *ramosaria* Vill. was the correct name for this species, having priority over HÜBNER's name of *vittaria*. It was quite recognizably figured and described, although DE VILLERS did not express himself very clearly on the antennal structure. In any case *vittaria* was a preoccupied name, and if *ramosaria* were not accepted a new name would be necessary.

perpusillaria.

C. perpusillaria Ev. (4 a) is on an average somewhat smaller than *ramosaria*, the forewing slightly narrower. The ♂, moreover, may be distinguished at once by the considerably shorter antennal pectinations. The ground-colour is generally paler than the *transiens* form, the brown markings well expressed. The median line, which in typical *ramosaria* is sinuous, is in *perpusillaria* almost entirely straight. The dark distal bordering is intermediate between the two forms of *ramosaria*. Concerning the larva of this species, also, information is still wanting. It was discovered in the Sarepta district, but also occurs both east and west of the Caspian Sea and in the neighbourhood of Lake Zaizan.

C. filacearia H.-Sch. (= flaveolaria Tr. nec Hbn.) (7 d). Certainly less closely related to the two preceding *filacearia*. than they to one another, but the structural differences seem to me quite insufficient to justify the retention of the genus *Chrysoctenis*, which MEYRICK proposed for it. He relied chiefly on the course of the first subcostal vein of the forewing which, as pointed out above, is inconstant. It seems that the extremity of the areole is less frequently open in *filacearia* than in the other species, but this structure does occur. The palpus, leg, etc., are quite normal; the antennal pectinations shorter than in the other species. In size, shape and colour *filacearia* closely approaches *Ptychopoda aureolaria*, but the tone of colour is not quite so bright, the lines are more weakly expressed, the inner line of the forewing obsolescent, the postmedian of the hindwing on an average rather straighter, the fringe, though darkened, much less blackish and the underside duller. Larva stumpy, dorsally and ventrally flattened, with strong transverse folds, the surface granular, setae short. Head small, black-brown. Body with very pronounced lateral carination; olive-brownish, becoming more violet brown in later stages; dorsal line and a shield-shaped spot on the fifth abdominal light reddish violet, the dark lateral ridge with a similarly coloured elongate spot on each segment, especially the 2.—5. abdominal, anteriorly somewhat convergent; ventral surface dark violet brown. Very different in its dark colour and peculiar violet markings from the larvae of the *aureolaria*-group of *Ptychopoda*. The moth flies from the end of May to July, and is local from Spain through Southern Europe and Central Asia to Issyk Kul.

20. Genus: **Ptychopoda** Curt.

Face smooth. Palpus not hairy. Antenna in ♂ ciliated (but see *maderae*). Hindtibia in ♂ with a pair of spurs (section *Sterrha*) or without spurs (section *Ptychopoda*), in the latter case often shortened and thickened; tarsus often abbreviated; ♀ with a pair of spurs. Forewing very variable in width, on an average less broad than in *Acidalia*, sometimes quite narrow; its distal margin nearly always entire; neuration as in *Acidalia* or (very rarely) with the areole open at its end, the first subcostal failing to anastomose with the others. Hindwing very variable in width, its distal margin smooth or somewhat crenulate, sometimes with excisions, slight or deeper, between the radials and again towards the anal angle, but never with a single marked angle or tail at the third radial; second subcostal moderately to very long stalked with first radial. ♂ genitalia less homogeneous than those of *Acidalia*, commonly with the valves narrow, fused at the base, so that it is impossible to obtain a displayed view of them without rupturing their union.

The early stages are also less homogeneous than those of *Acidalia*, and it is possible that the genus, which is at present a very extensive one, may later admit of subdivision on biological grounds. The egg is sometimes similar to that of *Acidalia*, at other times very different; thus some are less elongate, with strong hexagonal pattern or covered with a network of dark markings. The known eggs will be described in their places, but no systematisation of their forms seems at present possible. The larvae are strongly rugose, much less regularly cylindrical than those of *Acidalia*, tapering strongly anteriorly, generally with strong lateral carination, often quite short and stout, never so elongate as in *Acidalia*, but very variable in this respect. They show a much more marked predilection for dry or withered leaves than those of *Acidalia*. The pupa is sometimes less polished than in *Acidalia* and has generally on the cremaster, so far as I have been able to observe, a group of 6 very fine and thread-like bristles with hooked tips. Some of the species produce a succession of generations during the warmer months, but others, even in warm climates, refuse to be hastened, the larva feeding very slowly for perhaps 11 months and a single brood of the perfect insect appearing about June or July. They are often exceedingly local, but generally plentiful where they occur, flying gently and seldom moving far from their chosen haunts.

The geographical range of *Ptychopoda* is almost coextensive with that of *Acidalia*, but no Arctic species are known and indeed the very great majority of its Palearctic representatives belong exclusively to the southern part of the region. It has not reached New Zealand and there seem to be but few species in South America; several which were described from the Neotropical Region as *Ptychopoda* have proved, on examination, to have a double areole.

Concerning the generic name, it is not quite certain that the one here used is older than those of HÜBNER. It was first published by CURTIS (from STEPHENS' manuscript) in September 1826 with specified type *dilutata* Haw. (= *biselata* Hufn.). Our leading systematists regard HÜBNER'S "Verzeichnis", or at least its latest sheets, as having been published about the end of 1826 or early in 1827, and unless an earlier date can be proved for it, it is clearly preferable to give priority to CURTIS' name; especially as this section is very much more extensive than that to which the Hübnerian name of *Sterrha* has hitherto been applied. Moreover it is convenient to be able to drop *Sterrha* and *Eois*, both of which have at times — the former incorrectly, the latter I believe correctly, been applied in a different sense from that of MEYRICK'S classification, namely to genera in the *Larentiinae*.

For convenience of reference, I have arranged this genus, like *Acidalia*, in sections according to

the presence or absence of spurs on the ♂ hindtibia; but it is unfortunately quite certain, especially from the curious case of *rusticata* and *vulpinaria*, that this gives only an artificial classification in some instances.

A. Section *Sterrha*. ♂ hindtibia with terminal spurs present.

aureolaria.

Pt. aureolaria Schiff. (= *trilineata* Scop. nec Hufn. = *bicincta* Geoff.) (4 a). Bright golden yellow, the extreme costal edge of the forewing black. Forewing with three, hindwing with two sharply defined grey or blackish lines, all nearly straight, or the inner line of the forewing or the outer of the hindwing may be slightly more irregular. Distal marginal line black, basal part of fringes blackish, their extremities paler. Under surface similar, forewing without the first line but sometimes with a little blackish dusting in basal area, both wings with a small black discal spot close proximally to (often touching) the median line. Even in the most weakly marked specimens (generally ♀♀) the lines are more sharply defined than in the similar *nigrocostata* species. — ab. **nigrocostata** Hirschke has on the upper surface a broad black costal stripe on the forewing and black basal streak on the hindwing; beneath the black costal area of the forewing is still further extended and both wings have the basal area blackened. Described from a single ♂ from Austria. — The larva is one of the more slender in the genus, the lateral ridge sharp; it is reddish grey, the fine white dorsal line edged with black, the subdorsal line almost obsolete, but expanding into a dark spot at each segment-incision. Tubercles very small, only more distinct on the thoracic segments. The pupa is yellowish, with the cremaster dark; according to ROGENHOFER with four curved-tipped bristles, but probably two had become broken or were overlooked; REBEL says "five or six". Double brooded, occurring through June and into July and again in August. It has a moderately extended range in Central and Southern Europe, especially in the more eastern parts, and reappears in Central Asia along the mountain ranges from Armenia to Mongolia.

luteolaria.

Pt. luteolaria Const. (4 a). Less brightly coloured than the preceding. Usually reddish ochreous, very rarely yellow, and even then not so golden as *aureolaria*. The lines red-brown, hence much less prominent, only the postmedian sometimes more fuscous-mixed. A slight reddish shade usually follows the postmedian and to this succeeds an indistinctly pale subterminal line. The fringes in strongly-marked examples are very varied, at their base reddish, then nearly black, then with a very fine whitish line and finally grey. On the under surface the median and postmedian lines are thickened and blackened and the rufous shading which follows the latter is usually dusted with black. A very local species, inhabiting the Pyrenees and the mountains of Spain. I have it from various Spanish localities, collected by Dr. CHAPMAN in July. It first appears, however, in June or even in May and there is a partial second brood in the autumn. Larva rather short and thick, attenuated anteriorly, head small, brown; body ochreous, browner at the incisions, with an X-shaped black dorsal pattern on the middle segments; the whitish lateral line fine and interrupted; spiracles minute, not noticeable without a lens; no ventral line, but two small diagonal brown marks on each of the middle segments. Polyphagous but seems to show a preference for the petals of Geranium and other flowers.

falckii.

Pt. falckii Hedem. (= *falcki* Stgr.) from Amurland, is unknown to me. It is said to belong in the *aureolaria* group, but the structure of the ♂ hindleg is not expressly mentioned. The ♂ is red-brown, darker towards the distal margin, the ♀ very variable in colour, lighter reddish brown to clay-yellowish. The forewing has three, the hindwing two blackish brown transverse lines and a fine blackish distal marginal line. The fringes are broadly black-brown in the middle, basally and at their extremities grey, in the ♀ tinged with yellowish. The lines are curved anteriorly, that of the hindwing more waved. Underside dusted with red-brown, especially in the distal area, the median and postmedian lines thicker than above, the first line wanting.

ochrata.

Pt. ochrata Scop. (= *corrigata* F. = *pallidaria* Hbn. = *ochrearia* Hbn. = *perochraria* Dbld., nec F. R.) (4 a). Reddish ochreous with the lines more reddish, seldom very sharply defined; the basal and median usually rather thick, the postmedian finer. Forewing with first line gently curved or strongly bent, often weak or obsolete; median line sometimes a little curved near costal margin; postmedian parallel with distal margin, very faintly wavy or denticulate; two moderately distinct lines or shades enclose the pale subterminal. Fringe with dark dots opposite the veins, though very variable in intensity. Hindwing without the first line, the postmedian more sinuous. A minute dark discal dot is usually discernible on the hindwing and very occasionally on the forewing. On both wings the area between the median and postmedian lines is usually somewhat clearer than the rest. The under surface is more strongly dark dusted; as a rule only the subterminal line remains altogether free from the dusting; the lines and shades, except the first line of the forewing, are better expressed, in well marked specimens very dark. An abundant species in Central and Southern Europe and extending eastward as far as Transcaspiia; June—August. It is very variable in size

and colour, but the variation does not appear to be to any very marked degree local, and the three attempts which have been made to indicate local races have not been entirely successful, although they are of some service in showing general tendencies. I quote them as "forms", a vague general term which can include both the conception of an aberration and that of a local race. — f. *sicula* Z. (= *accretata* Fuchs) is the *sicula*. large form which is prevalent in many southern localities and perhaps in some (as in Sicily, whence came ZELLER's and FUCHS's types) forms a moderately well-defined race. It is paler than the form which is regarded as the type, less mixed with reddish, but shows otherwise a similar range of variation. The distinction in the course of the median line, founded by FUCHS on a single specimen, is quite unreliable. — f. *albida*. *albida* Ribbe is a very light form, said to be prevalent in Southern Spain but also to be met with occasionally in other localities. It is not well described, but is probably similar to an aberration which is rather frequent in Crete (among darker and brighter forms), the ground-colour very pale ochreous, between the median and postmedian lines sometimes almost white, the reddish lines sometimes of almost the same colour as in the type-form, hence rather distinct, sometimes paler. It should be added that I have many examples from Northern and Central Spain and only very few of these are of the *albida* form; the majority agree with my material from Italy, Turkey, etc. — f. *cantiata* form. nov. (= *perochraria* Guen. nec Fisch.-Röss.) is a *cantiata*. small, rather dull form with but little red in its colouring. It is rather pale, but less so than *albida*. It forms a fixed local race in England, where it is almost confined to one locality on the coast of Kent; but similar specimens might be picked out occasionally from among continental material. GUENÉE was the first to call attention to this race, which he calls var. A, quoting the untenable name of *perochraria* Steph. — The egg of *ochrata* is oval, strongly ribbed and finely reticulated, its colour straw-yellow, changing to brown just before hatching. The larva is moderately stout, tapering anteriorly; head rather flat and small; skin rugose, lateral ridge developed; yellowish grey, with fine double dorsal grey line obscurely indicated, subdorsal indicated by broken rows of grey dots. Polyphagous like most of the genus, but apparently preferring withered flowers. BUCKLER's statement that the anterior prolegs of this larva are placed on the *seventh* abdominal segment is erroneous. Pupa light, shining chestnut brown, anal extremity darker brown.

Pt. subochraria Stgr. is only known to me from the description. The hindtibial structure is not indicated and as it is said to be intermediate between *perochraria* (*serpentata*) and *numidaria* it is possible that it should be placed with the former, in the spurless group. Ground-colour light ochreous with sharp black discal dot and usually four darker lines or narrow bands, which are slightly dentate or waved. Sometimes one of the lines is wanting. The colour is similar to that of light *numidaria*. The large black discal spot of both wings distinguishes it from both the species mentioned, but it differs chiefly in the ♂ antenna, which has longer and more widely separated teeth. On the underside only the two outer dark lines are distinct and these are less strong than in *numidaria*, the first of them nearer to the discal spot. North Ferghana (Namangan).

Pt. numidaria Luc. (4 b). Related to *ochrata*, but of a yellower tone of colour, without the coarse *numidaria*. darker dusting of that species, the under surface consequently much lighter. The lines are more wavy, the fringes not concolorous but distally greyer, though less strongly in some specimens than in others, and not shown in our figure. Structurally *numidaria* agrees with *ochrata*, but the forewing appears slightly broader, the distal margin being somewhat less oblique. Algeria.

Pt. rufaria Hbn. (4 b) superficially resembles a large, pale form of *ochrata*. The ground-colour is nearly *rufaria*. the same, but in general slightly less ochreous, in the ♂ paler, in the ♀ often rather more tinged with rufous, the lines on an average more brownish. They are similarly placed, but the median and postmedian of the hindwing more often stand near together, rather recalling the position in *macilentaria*. The postmedian of the forewing is rather more sinuous and denticulate; the shading on either side of the pale subterminal is on an average weaker. The fringes are not dark-dotted. The underside is less dusted. But the best distinction in the markings is in the presence on both wings of a conspicuous blackish discal dot, that of the forewing generally small, that of the hindwing larger. Structurally the ♂♂ are very easy to discriminate; in *rufaria* the antennal ciliation is extremely short, much shorter than the diameter of the shaft; in *ochrata* the joints project strongly and the ciliation is rather long, arranged in pairs of fascicles. — ab. *nigrocinctaria* F. Fuchs is described as *nigrocinctaria*. having three thick black transverse striae through both wings and occurs regularly among the type-form in the Bornich district. I have seen forms with one or two of the lines (especially the postmedian) strongly blackish, but nothing so extreme as this. There is, however, much variation in the tone of the ground-colour and the strength of the markings. A grey aberration (or local race?) with three dark transverse striae, the other lines obsolete, of which two examples from N. Caucasus (Ielesnovodsk, July) are recorded by ALPHÉRAKY, may provisionally be regarded as a colour modification of this form. Larva of moderate proportions, not tapering very strongly anteriorly; yellowish grey, the pale mediodorsal line distinct, dark edged, accompanied by irre-

gular, trapezoidal dark marks and dots. Tubercles very small, the thoracic larger. Pupa yellow-brown. Central and Southern Europe to Central Asia, July—August.

taurica.

Pt. taurica *Bang-Haas* would seem to belong here, although its author does not mention its structure. Dr. REBEL, in determining the Herzegovina example, indicated its probable position, from the point of view of structure, as between *filacearia* and *aureolaria*, but gave no detail. It is described as light ochre-yellow, the basal area and inner margin of the forewing and the base of the hindwing somewhat paler. Forewing with costal margin sparsely dusted with brownish. The lines brownish, waved, similar to those of *consanguinaria* in their course but materially more distinct (thicker). Both wings with black discal dot. Black terminal dots at the vein-ends on both surfaces (this should probably read "on the base of the fringe opposite the vein-ends"). Under surface dirty yellowish, the transverse lines in the distal area and the discal dots very weak. Forewing rather broader than in *rufaria*, hindwing with distal margin rounded. The size is that of a large *rufaria*. Described from the Taurus. A single specimen has since been taken in Herzegovina by SCHAWERDA.

consanguinaria.

Pt. consanguinaria *Led.* (= *faillata* *Trti.*) (4 b) closely resembles *rufaria* but is paler, more glossy, rather weakly marked, the lines occasionally almost obsolete. The postmedian line and proximal shading of the subterminal are on the forewing still more sinuous and terminate on the posterior margin with more of a distally directed curve. The discal dots are small, but black. There are usually some distinct black dots at the base of the fringes, opposite the veins; in *rufaria* the fringe is unspotted. The under surface is very weakly marked, sometimes almost entirely without markings. ♂ antennal ciliation very minute. The larva, according to HUGO MAY sen., is elongate, narrowing towards the head, somewhat flattened, the lateral carination distinct; dorsal area light brownish or wood-colour, medio-dorsal line light, on the last 4 segments sharply margined with black; tubercles strong, black; an ill-defined black-grey subdorsal stripe, on the middle segments often spreading in some dark dusting so as to encroach on the ground-colour; spiracles black; ventral surface blackish. Pupa elongate, the cremaster umbilicated, the bristles short. Flies in July, in captivity a second brood may be obtained in October—November. Very local, occurring in Italy, S. E. Europe and Asia Minor; has been reported from Spain, but I have no certain knowledge of any Spanish examples.

macilentaria.

Pt. macilentaria *H.-Sch.* (= *antiquaria* *H.-Sch.*, *sylvestraria* *Dup. part.*) (4 b). Quite distinct from the *ochrata*-group in having the ground-colour dirty whitish, only suffused with dull ochreous in the costal part of the forewing, especially towards the base. The distal margin of the hindwing is appreciably concave, though only very slightly, between the radials; in none of the preceding species, except perhaps *rufaria*, can this be spoken of as appreciable, though the margin shows a tendency to be straighter or less convex. The lines on the forewing do not differ greatly in their course from those of *ochrata*; on the hindwing the median and postmedian are placed very near together and there is a rather broad, faint grey shade between the latter and the pale subterminal. Discal dots about as in *ochrata*. Forewing beneath strongly and hindwing moderately dusted with coarse blackish-fuscous atoms, the median and postmedian lines very strong and dark, the latter placed nearer to the distal margin than on the upperside; subterminal line more distinct than above. ♂ antennal

pulchraria.

structure similar to that of *ochrata*. — ab. **pulchraria** *F. Fuchs* is described as having a broad dark central shade on the forewing and a broad marginal line on both wings. Described from a single example. — The larva resembles that of *ochrata*. It is of medium thickness, strongly tapering anteriorly, at the segment-incisions constricted, especially at the 5. abdominal; greenish at first, becoming bone-coloured in its adult stage; dorsal line light, brownish-edged, on the last three segments accompanied by brownish subdorsal line, which is otherwise obsolescent, though indicated by dark dots at the segment-incisions; head somewhat more reddish; ventral surface dark grey. The moth appears in June—July and frequents dry meadows. It is local in western Germany and Austria and in Switzerland, but seems commoner in France and Spain.

determinata.

Pt. determinata *Stgr.* (= *geministrigata* *Fuchs*) (3 e). Ground-colour similar to that of the preceding, rather more glossy and without such marked ochreous costal suffusion. Really nearer to *litigiosaria*. Both differ from *macilentaria* in wanting the concavity of the margin of the hindwing, in having shorter and simpler antennal ciliation (minute in *determinata*, intermediate in *litigiosaria*), distinct black discal dots, more weakly marked underside, white vertex of head (in *macilentaria* brown), etc. *determinata* is easily distinguished from *litigiosaria* by the presence on both wings of a median line, which is placed very near the postmedian. The latter on both wings is more irregular in its course, being twice deeply incurved. The under surface of the forewing is dark-dusted as far as the postmedian line, distally similar to the upper surface; that of the hindwing is paler and more weakly marked than above. Hitherto only known from Sicily, Calabria and the South-eastern Taurus. This summer, however, the Rev. F. E. LOWE has taken a few examples of both sexes at Sainte-Baume, on a high table-land N. E. of Marseilles, where they occurred at the end of June on very dry, open

ground amid a growth of aromatic woody flowers, in company with *macilentaria*, *litigosaria* and swarms of *sericeata*. In Sicily STAUDINGER captured *determinata* at light in September—October. In one or two of the Sainte-Baume examples the median line is so weak as to suggest a transition towards *mutilata* Stgr., which however I am not able to compare.

Pt. fasciata Stgr. Unknown to me. Said to be nearest to *determinata* Stgr., though with a superficial resemblance to *diffluata* H.-Sch., which is structurally quite distinct. Size of *determinata*. Bone-colour, with black discal dots, closely followed by a moderately broad, sharply defined grey-black band which is irregularly dentate distally; forewing in addition with a sharp blackish inner line. The area between the band and the distal margin is largely occupied by two faint dark shades (narrow bands) which enclose the pale subterminal line. Fringes with black dots at base. On the under surface the inner line is wanting; the dark band, especially on the hindwing, is more broken up into the two lines (median and postmedian) from whose union it was composed. Even on the upper surface the band (which is about 2 mm in breadth) contains remnants of the light ground-colour, especially in one aberration on the hindwing. Only known from the eastern Taurus, where it was discovered in June. The possibility does not seem to me to be excluded that it may be an aberration of *determinata*, bearing to it the same relation as *aversata* L. to ab. *remutata* L.

Pt. litigosaria Bdv. (= *morosaria* H.-Sch., *agraria* Joan.) (4 b). Characterized by the entire absence of the median line, the forewing therefore having only two lines, the hindwing only one; the dark shading to the pale subterminal is weak. Discal dots black, distinct, variable in size; distinct black dots on the base of the fringe are often present, sometimes large, but are very inconstant. The under surface of the forewing is more or less strongly infuscated, leaving a pale line distally to the postmedian and a pale subterminal; that of the hindwing is pale and very weakly marked. Very variable in size and in the strength of the markings, even also in the degree of sinuosity of the postmedian line; sometimes the inner line of the forewing is wanting. My only Algerian example is rather weakly marked and differs from my Spanish series in having the forewing scarcely at all infuscated beneath; but I do not think the name *agraria* (also founded on an Algerian example) can be maintained as representing a distinct race. — ab. **dissidiata** Guen. has both lines very distinct, blackish, the postmedian more strongly sinuous than in the type form, very pronouncedly incurved between the radials. The two specimens on which GUENÉE founded the name, one from Andalusia and one from the Basses-Alpes, were a little larger than normal *litigosaria*, their ground-colour more unicolorous, the discal dot of the hindwing almost smaller than that of the forewing, whereas in typical *litigosaria* the reverse is more usually the case; and he regarded his *dissidiata* as "well distinct" specifically. STAUDINGER, however, on examination of the types, informs us that it is certainly a mere aberration, an opinion in which I heartily concur. Egg nearer spherical than ovate, its lower pole narrowed; surface very finely granulated, with small, slight, polygonal depressions. Larva similar in form to that of *aversata*, gradually tapering anteriorly from the fifth abdominal, strongly carinated laterally, folded transversely, rugose, especially anteriorly and posteriorly; yellowish grey, paler laterally, much darker ventrally; a double dorsal brown line, usually interrupted, a subdorsal band also interrupted; variable. Pupa pale yellowish brown, anally blackish, the bristles rather long; spiracles large and prominent. The moth flies in June and July and is attracted by light and by artificial sweets. S. France, Spain, Italy, Corsica and N. Africa.

Pt. mutilata Stgr. Unknown to me. From the description I should have supposed that it was another form of *litigosaria*, even more extreme than ab. *dissidiata*, or possibly an aberration of *determinata* (which was taken at the same time and place) with the median line wanting. Agrees with *litigosaria* in structure, in size and in the under surface. Light grey with very slight yellowish tinge, especially in the ♀. Discal dots above at least as strong as in *litigosaria*, beneath much weaker. First line distinctly present. Postmedian very strong, on both wings strongly and irregularly dentate. Black terminal dots or streaks strongly expressed. Sicily, taken at light in October.

Pt. concordaria Püng., sp. nov. (= *sardonata* Homberg) (3f). For this new species, as well as *Pt. rhodogrammaria*, *ostrinaria* ab. *oenoparia*, *hispanaria* and *degeneraria* ab. *floridaria*, manuscript descriptions have been furnished by Herr PÜNGLER, in whose collection are the types. He is therefore to be quoted as the author. I take this opportunity to express my warmest thanks to Herr PÜNGLER for the extremely valuable aid which he has rendered in connection with this work. A large number of our figured specimens of the rarer species were lent by him for this purpose, and he has further most kindly lent me for study whatever material I required from his very rich collection, besides giving me much information and some critical expressions of opinion on difficult questions. "Expanse 23 mm. Near the somewhat larger *litigosaria* Bdv., more pointed-winged, more smoothly scaled, colour more grey-yellowish, discal dots finer, median shade present, postmedian line less sharply

expressed. In shape, colour and markings also similar to small, weakly marked specimens of *degeneraria* Hbn. ab. *depravata* Stgr. and *deversaria* H.-Sch., differing in the spurred, not aborted ♂ hindleg, the dark-spotted antenna and the dark underside of the forewing. S. Spain, Murcia, Sierra d'España, 4 ♂♂, 5 ♀♀, M. KORB, end of June, 1909; East Pyrenees, Sorède, 1 ♂, J. R. SPRÖNGERTS." *sardonata* Homberg has been described under this name only about a month after the publication of our plate. Occurs at Vernet-les-Bains (Pyrenées-Orientales), St.-Guilhemle-Désert (Hérault) and San-Ildefonso (Sierra de Guadarrama Spain).

plumbaginata. — ab. *plumbaginata* Homberg, from Vernet-les-Bains, is darkened with brown scales, showing violet reflections, less numerous at the costal margin, the lines partly obliterated, postmedian and subterminal more noticeable; fringe pale; under surface smoky, but less strongly than upper.

lambessata.

Pt. lambessata Ob. (= *granadaria* Stgr.) (4 b). Differs from *litigosaria* in its more greyish, not yellowish-white colour (our figure is much too yellow), stronger silky gloss, extreme weakness of the lines and obsolescence of the black discal dots; the costal edge of the forewing and also the fringes are yellowish. Minute black dots are present on the base of the fringes. The forewing beneath is slightly smoky and the two pale lines indicated as in *litigosaria*; the hindwing white, unmarked; the dots in the fringes at least as strong as above, or perhaps stronger. ♂ antennal ciliation rather shorter than in *litigosaria*. OBERTHÜR states that *lambessata* is rather larger than *litigosaria* and this may be correct as a generalisation, but both are susceptible to considerable variation in size. Herr PÜNGELER has bred *lambessata* from the egg and informs me that the larva and pupa resemble those of *litigosaria*. Inhabits Spain, Portugal and North Africa, end of May to July.

consecrata.

Pt. consecrata Stgr. (3 e) is very easily distinguished by the pink postmedian band or shade on both wings, which rather recalls *Rhodostrophia*. Our figure gives an accurate impression of the upper surface and a detailed description is unnecessary. The antemedian line is quite indistinct; distal boundary of the pink band ill-defined; dots at base of fringe minute, not very conspicuous. On the under surface the pink band is sometimes wanting; the basal part of the forewing, especially costally, is somewhat suffused; the only distinct marking is the pink band or the dark line which on the upper surface borders this proximally; the cell-spots also present. ♂ antennal ciliation rather short. Only known from Palestine.

lucellata.

Pt. lucellata Püng. (3 e). Colour of forewing somewhat as in *rufaria*, costally more suffused with reddish. Very distinct in the narrower, more elongate wings, the hindwing more whitish, not (as in nearly all the species of the genus) concolorous with the forewing. The fine reddish inner line of the forewing is bent near the costa, the outer parallel with the distal margin; median shade thicker, crossing the cell-spot. Subterminal line scarcely indicated. Hindwing with inner line wanting, median shade placed just beyond the cell-spot. The position of the median line and the expression of the cell-spots are subject to considerable variation; in the type ♀, which is smaller and narrower than the ♂, the median line is placed much nearer to the postmedian and the discal spots are wanting; even in the ♂ they are brown (not so black as in our figure) and are wanting beneath. Under surface with the wings concolorous, the forewing being paler, the hindwing less white than above; both, but especially the forewing, shaded with red costally; first line of forewing wanting. ♂ antennal ciliation not long. Togus-Torau, Central Asia, only a few ♂♂ and the single ♀ yet known.

ossiculata.

Pt. ossiculata Led. (4 b) is another rather narrow-winged species, in this differing from the similarly coloured species such as *litigosaria* or *macilentaria*. Whitish bone-colour, the lines rather thick and wavy but not very conspicuous, being only a little darker than the ground-colour. Antemedian line almost or entirely lost in a slight basal suffusion, which on both wings extends as far as the median line; the other lines tolerably equal in expression, parallel with the distal margin. Cell-spots very small or obsolescent. Fringes with very small black dots opposite the veins. Distributed from Asia Minor and Syria to the Zaizan district.

proclivata.

Pt. proclivata Fuchs (3 f). Very close to the preceding but considerably smaller. As I have only a single specimen before me I am unable to indicate what are the other most constant distinctions; nor even to affirm positively that it might not be a second generation or local race of *ossiculata*. The specimen before me appears to have slightly less pointed forewing, is somewhat more suffused and weakly marked both above, and on the hindwing beneath, the costal edge of the forewing somewhat yellower; the black discal dots and those at the base of the fringe are wanting. According to FUCHS, however, a fine discal dot is sometimes present on the hindwing. Only known from Russian Armenia.

mediaria.

Pt. mediaria Hbn. (3 f). Quite distinct in markings from any other species possessing the same structure; rather recalling, except in shape and colour, certain species of *Acidalia*, e. g. *emutaria* Hbn., or rather *hanna* Btl. Forewing somewhat pointed, though less elongate than in the preceding species; brownish white with scattered dark scales. Lines dark grey-brown, almost blackish. Median shade on both wings particularly

strongly developed, nearly straight, very slightly oblique, becoming faint or obsolete before costal margin of forewing. Fringes with small dark dots at base. Under surface of forewing with dark suffusion; of hindwing less dark-speckled than above, hence appearing whiter. The larva is rather short, attenuated anteriorly, the lateral carination slight, the transverse folds very strong; a broad brown dorsal stripe, the lateral area paler, without a strongly marked pale spiracular line; spiracles small, black, not visible to the naked eye; head small, perpendicularly marked with brown; meso- and metathorax each with a well-marked brown dot on the side. On *Euphorbia spinosa*, the leaves in preference to the flowers. Grows very slowly. Pupa brown anteriorly, abdominal segments reddish. Imago in July. Spain, S. France, N. Italy, Dalmatia and Bithynia.

Pt. renataria *Ob.* (= *mediaria*? *Ob.* nec *Hbn.*) (4 b) resembles *mediaria* in the broad blackish median *renataria*. line, but differs in so many characters that confusion ought to be impossible. Larger, both wings narrower, more elongate, forewing rather more brownish, without distinct first line; median shade more oblique, on hindwing much nearer to the base; postmedian line of forewing followed by a thick dark line, that of hindwing by a shade as broad and conspicuous as the median shade. The underside is similar to the upper or only a little more suffused and less distinctly marked. ♂ antennal ciliation short. Out of three specimens examined, two show the first subcostal vein of the forewing free; as in *Cleta*; in one example this is the case, and very markedly, in both wings, while in the other the first subcostal on one wing touches (but scarcely anastomoses with) the stalk of the others. Algeria; end of April.

Pt. sericeata *Hbn.* (4 b) is again very distinct and easily recognized, the only similar species being the *sericeata*. following. White, very glossy, the lines bright light brown, very variable in breadth but on the forewing commonly so broad as to reduce the ground-colour itself to a series of four wavy lines, or occasionally even only three, the second and third brown lines being sometimes fused into a band, containing only a few small white spots. Hindwing with only two lines (bands) and distal margin brown. Under surface similar, the brown coloration usually darker, the basal part of forewing more suffused, but remaining whitish towards posterior margin. ♂ antenna very shortly ciliated. The ♀♀ are smaller, rather narrower, on an average more sharply marked, with the brown lines or bands less broad. I have one or two pretty forms from Vigo in which the white colour largely preponderates over the brown. *sericeata* is locally abundant in warm meadows in Southern Europe and Asia Minor and is also recorded from Transcaucasia, the Ili and Issyk Kul. Egg ellipsoid, short, strongly compressed laterally, with large, very regular hexagonal depressions. Larva tapering anteriorly from the fifth abdominal, which is the broadest; laterally carinated; skin rugose, with distinct folds and small warts, particularly in the anterior and posterior part; yellowish grey, with very slight tinge of green, finely spotted with brown, fifth abdominal ventrally pale, a double brown dorsal line, most distinct posteriorly; no subdorsal, merely some brownish spots; some dark lateral spots opposite the spiracles. Pupa moderately elongate, dark reddish brown, anally blackish, wings lighter, with distinct veins. The moth flies in May—June.

Pt. allardiata *Mab.* (4 b) represents *sericeata* in Algeria and scarcely differs except in having the lines *allardiata*. straighter, the second and third narrower and nearer together (or, when they coalesce, forming a narrower band), the white band distally to them almost perfectly straight, not showing the definite outward bend in the middle which always occurs in *sericeata*. The average size is larger, but this can not be relied upon as a distinction. The brown parts are on the whole slightly lighter and less bright. Our figures scarcely show the distinctions.

Pt. merklaria *Ob.* (4 c) is a very distinct species, with the forewing rather narrow, its apex acute, *merklaria*. the distal margin slightly concave behind the apex, then straight, the hindwing also narrow. The ground-colour is variable, oftenest white or with a weak yellowish tinge, the basal part at least largely shaded with yellowish; the lines yellow-brown, parallel with the distal margin, usually accompanied, as in the figured example, by light yellowish bands which leave the white ground-colour in alternating bands, somewhat recalling the scheme of pattern in the two preceding species, or in *circuitaria*, with which OBERTHÜR compares it. The under surface is similarly marked to the upper. The ♂ antennal ciliation is only of quite moderate length. Variation consists in the colour and strength of the suffusion, which may be darker or even slightly reddish, and in the strength of the lines. OBERTHÜR's figure shows a very white form, with the bands not strongly developed. — ab. **terentius** *Baker* is a dark aberration, with the ground-colour ochreous brown and the *terentius*. lines more fuscous, but as it seems to be connected with the type-form by intermediates it is not susceptible of absolutely sharp differentiation. *merklaria* is only known from Algeria, where it occurs in March and April; the type specimen of ab. *terentius* is from Lambessa.

Pt. fathmaria *Oberth.* (4 d). Wings quite narrow, the distal margin of the hindwing without strong excision *fathmaria*.

between the radials and with only a very slight sinuosity towards the anal angle. Mouse-grey, not strongly brown-tinged, antemedian line angled, median and postmedian parallel with distal margin, dark proximal shading to subterminal and the subterminal itself weak or wanting. Hindwing without antemedian line. Both wings with dark cell-dot. Under surface paler grey, similarly marked. Egg ellipsoid, slightly flattened at the sides, surface presenting 10—12 rather broad channels formed by elliptical depressions; white, becoming somewhat rosy. Larva short, thick, attenuated anteriorly from the 3. abdominal and carinated laterally, segment-incisions not deep; skin transversely folded, rugose, granulated; greyish clay-colour, tinged with greenish, some lines and striation brown; dorsal fine, hardly distinct, subdorsal broken, forming vague lozenges and curved marks, lateral line formed of oblique striae; the lateral carina pale; ventral double, festooned; tubercles small, not very distinct, setae very short, claviform; head flattened in front. Feeds on low plants, accepting either fresh or withered leaves. Undergoes 3 moults. Pupa smooth, shining, reddish brown; wing-veins prominent; cremaster broad at its base, suddenly narrowing, ending in a pointed beak. A succession of broods throughout the summer. Algeria. OBERTHÜR, on account of the shape, referred this species to *Euacidalia*, which has a double areole.

volloni.

Pt. volloni *Luc. u. Joan.* (= *plumbearia* *Bang-Haas* nec *Leech*) is very similar to the preceding species, but may be distinguished at once by the course of the postmedian line, which is angularly broken near the costal margin of the forewing, forming an acute angle inwards, then oblique outwards to another acute angle on the first radial; it is punctuated with blacker spots or dashes on the veins. The forewing is shiny yellowish grey, dusted with brown, no other lines (or only the median shade) distinct, fringes dark-spotted. Hindwing paler, the postmedian line discernible but often weak. The discal dot is wanting on both wings. Nefta, Southern Tunis. Following OBERTHÜR, the authors referred this species to *Euacidalia*. In the figure which they give of the neurulation the first subcostal of the forewing is represented as free, as in *Cleta*. In a series of 8 larger examples from Hammam-es-Salahin, Algeria, bred by Lord WALSINGHAM from *Anabasis articulata* in March 1904, which I believe to be the same species, this vein anastomoses or is connected by a short bar with the other subcostals.

scabraria.

Pt. scabraria *Chrét.* Forewing elongate, distal margin strongly oblique; yellowish ochreous more or less strongly powdered with brown, the markings brown, more or less defined; shows the slight rosy reflection so general in the Lepidoptera of Biskra; first line acutely angled, becoming nearly parallel with the distal margin; postmedian thick, ill-defined, shading off into the ground-colour, sinuous, subparallel with the distal margin; median shade hardly broader than postmedian, sinuous; pale subterminal line undulate; distal border uniformly pale yellowish ochreous; cell-spot more or less large and distinct, sometimes contiguous to the postmedian, sometimes removed from it; fringe reddish grey, marked with brown. Hindwing rather short, rounded at anal angle, very little emarginate between the radials, markings similar to those of forewing. Forewing beneath variable in the strength of the markings, which are often obsolescent; sometimes, especially in the ♀, the median and postmedian are more strongly expressed than above. ♂ antenna described as "pectinate", probably dentate; hindtibia apparently with very slender spurs. Egg a short, broad ellipsoid with small oval depressions arranged in rows so as to form rather deep channels; colour whitish. Larva recalling in shape that of *infirmaria*; short, thick, attenuated anteriorly, carinated laterally, segmental incisions not deep; skin transversely folded, rugose and granulated; dorsally greyish, laterally whitish with slight fleshy tint; a double blackish dorsal line, distinct only on the last segments; subdorsal sinuous, approaching the dorsal at the incisions, forming a sort of lozenge-shaped pattern; a broad blackish brown dorsal spot in the middle of the 2., 3. and 4. abdominals. The moth is probably double-brooded and occurs at Biskra, Algeria.

tineata.

Pt. tineata *Th.-Mieg* should perhaps be placed here, as it is said to have elongate wings and to resemble *scabraria*. It is also said to "recall somewhat *asellaria* and *pecharia*", but this probably refers only to the dusky colouring. "♀ 12 to 17 mm. Rather dark grey, sprinkled with innumerable small black scales. These black scales are so arranged as to form, on the forewing, 6 transverse lines, a little undulate and very vague. On the hindwing are discernible, but with difficulty, 4 such lines, one a little before the discal dot and the other 3 between this latter and the distal margin. A small black discal dot on each wing. The costa of the forewing is a little shaded with blackish and 2 or 3 blackish spots are visible, indicating the commencement of the lines. Some small black vein-dots at the distal margin, fringe long, agreeing with the ground-colour. Under surface of the same shade as above, with the same lines, equally inconspicuous, and the discal dots as above. Face and palpus blackish grey, vertex white, thorax and abdomen grey dotted with black, legs grey, the hindleg with a single pair of spurs. Akbes (Syria), 5 ♀♀."

attenuaria.

Pt. attenuaria *Rbr.* (3 h). Somewhat resembles pale specimens of *eriopodata* in coloration, especially

in the dark distal border of the forewing, broken off obliquely towards the apex; but is entirely different in shape and in many other particulars. Wings long and narrow, hindwing with distal margin strongly sinuate between the radials and more gently from first median to anal angle. Forewing with the lines and median shade commencing from enlarged dark spots on costal margin, sharply angled near costal margin; discal dot black, placed on median shade; a more or less strongly developed dark distal shade, traversed by a fine pale subterminal line; fringe obscurely dark-marked opposite the veins. Hindwing without the first line; dark distal shade less well defined. Under surface darkened with coarser blackish speckling, the basal part more suffused, both wings with cell-dot, median and postmedian lines. ♂ antenna with the joints thickened, subserrate, the ciliation very short. Concerning the early stages I have no information. *attenuaria* is a very local species, occurring in Corsica (where it was first discovered), Sardinia, Sicily and Algeria. On the first-named island, according to KOLLMORGEN, it is distributed in May and July up to elevations of 800 m.

Pt. moniliata Schiff. (= ? *pentalineata* Vill. = *omicata* F.) (4 b) shows no close resemblance to any *moniliata*. other known species and can always be recognized at a glance by the series of large, more or less rounded white spots in the distal area of both wings, from which it received its name. Whitish straw-colour, the veins marked with brown; the lines fine, dark, the first two more or less strongly angled near the costal margin; the cell-marks somewhat elongate; both wings with an uninterrupted blackish distal-marginal line, a similar line near the extremities of the fringe and a series of large black dots on the intervening pale part of the fringe. The egg is ovate, somewhat flattened, leather-yellow. The larva is rugose, short, much attenuated anteriorly, yellowish brown with rows of fine brown or blackish raised warts, four white lozenge-shaped dorsal spots on the middle segments, dark-bordered and accompanied by smaller white spots; ventral area marked with white on each segment. Pupa slender, pale shining yellow, anteriorly greenish, anal end reddish. The moth appears in the latter part of June and in July, and is widely distributed in Central and Southern Europe and from Asia Minor to Transcaspiæ. STAUDINGER does not specify the Iberian Peninsula in his list of localities, but this is no doubt merely an oversight, as it has there a wide range of distribution.

B. Section *Ptychopoda*. ♂ hindtibia with terminal spurs absent (except in *asellaria* and usually in the *rusticata*-group.)

Pt. nexata Hbn. (4 a). White, dusted with brown and with brown markings. Forewing somewhat *nexata*. suffused with brown in basal area, first and median lines usually approximated, the area between median and postmedian nearly free from brown dusting but containing a black discal dot; postmedian line somewhat sinuous; distal area brown, containing a white, twice thickened subterminal line rather near the termen; fringe spotted with brown. Hindwing white, with only two brown lines and with less dense brown shading in distal area. Under surface similarly marked, forewing without first line. ♂ antenna with fascicles of long cilia; hindleg short and slender. The ♀ is probably more sluggish; in a series of 20 before me there is not a single ♀; it is said to be stout-bodied, narrower-winged, the brown markings more argillaceous. *nexata* is very different structurally from *ramosaria* Vill. (*Cleta*), with which LEDERER associated it. STAUDINGER retains it at the commencement of his comprehensive genus *Acidalia*. Possibly it should be referred to the vicinity of *exilaria* and *fatimata*. Larva attenuated anteriorly, carinated laterally; yellowish green; dorsal line double, uninterrupted, reddish brown; subdorsal wanting; lateral line broad, pale, flexuous; spiracles oval, brown, almost imperceptible; ventral area faint bluish green with a single, rather broad, continuous line weakly indicated in greyish; head small, quadrate, reddish; prothorax and legs also tinged with reddish. Apparently polyphagous; MILLIÈRE reared it from the egg on the flowers of *Linaria organifolia*. Pupa somewhat compact, yellow, washed with greenish, antennae and abdominal incisions more or less reddish, and extremity brown. There seems to be a succession of broods, the duration of the larval and pupal stages in the summer being short. Imago in the spring, at the end of June and in August and even in November—December. Best known from Andalusia, Portugal and Algeria, but MILLIÈRE took it in the Basses-Pyrenees. — **cirtanaria** Luc. is almost certainly a *cirtanaria*. mere aberration of *nexata*. It seems to be of a rather less pure white, the basal area of the forewing more strongly brown as far as the median shade, which is darkened, the antemedian apparently either wanting or fused with the median; distal brown band rather broad. Described from a single ♂ taken near Constantine, Algeria, in May. LUCAS and GUENÉE erroneously compare it with *ramosaria* and *pygmaearia* instead of with *nexata*.

Pt. serpentata Hufn. (= ? *trifasciata* Scop. = *similata* Thnb. = *limitata* Bkh. = *ochrearia* Dup. *serpentata*. nec Hbn. = *perochraria* Fisch.-Rössl.) (4 a). Rather closely similar, especially in its paler forms or when worn, to *ochrata* Scop., with which it was often confused by the older entomologists, who did not study the structure. The ♂ hindtibia, though slender, lacks the spurs which are always developed in the preceding group;

the antennal joints project even more strongly than in *ochrata*. Apart from these structural characters, *serpentata* may generally be recognized by its smaller size, rather brighter but at the same time less glossy tone, somewhat darkened fringes, especially beneath, thicker and less clearly defined postmedian line, position of the median line and several other characters. The median line nearly always passes on the proximal side of the minute black cell-spot of the hindwing, occasionally crosses it; in *ochrata* it is beyond (placed distally to) the cell-spot, when such is present. A fine blackish distal marginal line is usually well developed, though more or less interrupted; dark spots in the fringe are usually wanting, never strong. On the under surface the lines, as in *ochrata*, are considerably darkened, but the ground-colour itself is generally much less suffused than in that species. Rather variable in ground-colour and in the strength of the markings. — *ab. griseata* *F. Fuchs* has the ground-colour uniformly grey, with the lines darker. Two examples were taken at Bornich, and by subjecting the larvae to moisture a further example was bred. I know of no others. — *ab. fuscomixtata* *ab. nov.* is a very handsome form with the lines strongly blackish-fuscous, the terminal line quite black, underside (especially of the forewing) strongly dusted with fuscous, the lines thick and intense. The fringes (especially beneath) are also more strongly infuscated. Described from a ♂ in the collection of Rev. *dohlmanni*. *F. E. Lowe*, taken in the marshes of St. Triphon, in the S. of Vaud, end of May, 1912. — *dohlmanni* *Hed.* is almost certainly nothing more than a local race of *serpentata*, perhaps scarcely that. I have only seen one example from Central Amurland and this does not agree in quite all particulars with the description. Moreover, I possess one ♂ from Barracouta which differs from the type form in almost the opposite direction to *dohlmanni*, being of a duller, less reddish ochreous and weakly marked, more like the Esthonian specimens. *dohlmanni* is a brightly coloured form, with the median line more weakly expressed than the others, the postmedian the strongest, on the hindwing more deeply bent proximad between the radials, hence appearing to project more between the third radial and second median. It is said to have the discal dot present on both wings, but in the example before me only the hindwing bears the dot, as usual. The fringe is well darkened. — The egg of *serpentata* is a very beautiful object under the microscope, the hexagonal depressions being very regular and very deep, their rims thus appearing to stand out very strongly; moreover they are marked with strong knots or buttons at the angles. Of the usual Geometrid shape, not very elongate; colour pale yellowish or greenish, the raised net-work dark grey to black. The larva is grey or wood-colour, sometimes almost without markings, sometimes with broken dorsal and subdorsal lines consisting of anteriorly pointed dashes on each segment; in form it does not differ greatly from that of *ochrata*, being moderately long, gradually tapering anteriorly, the segment-incisions apparently distinct, but not deep. It feeds on low plants, and has been reared from the egg on lettuce. Of the pupa I can find no description. The moth seems to be partially double-brooded, at least in the more southerly localities, and may be met with from June to August. It is said to be a true day-flier, being active in the sunshine. According to *VON NOLCKEN* the time of appearance in the Baltic Provinces is from about 20 June to 24 July and the ♂ appears about 8 days earlier than the ♀. Distributed almost throughout Europe except the polar region, Britain, Holland, Spain and Portugal; also in Asia Minor, Central Asia and Eastern Siberia.

flaveolaria.

Pt. flaveolaria *Hbn.* (= *brunnearia* *F. nec Vill.*) (4a) is nearest in aspect to *aureolaria* *Schiff.* and has probably been associated with it in the minds of lepidopterists ever since *HÜBNER* discovered it and gave it a name of similar formation. The structural difference in the ♂ hindtibia, however, necessitated their generic separation in *MEYRICK*'s system, and they here fall into different sections of our genus. Ground-colour generally of a slightly less clear yellow than in *aureolaria*, more inclining to ochreous; occasional aberrations occur, however, almost identical in coloration with that species. Fringes blacker. The lines on the upper surface are generally very much more weakly expressed, the first line of the forewing usually obsolete. Beneath, however, the postmedian and frequently also the median lines are as strong and blackish as in *aureolaria*, and the chief distinctions are the absence of the cell-spots and the presence, on the forewing at least, of more blackish dusting. Aberrations sometimes occur in which the lines of the upper surface are entirely wanting, but these intergrade through all possible transitions to the normal specimens. On the other hand I have one really striking aberration — *ab. nigrolineata* *ab. nov.*, which might easily be mistaken, on a casual inspection, for *aureolaria*. Upper surface with the lines as sharply expressed as in that species, including a strong inner line on forewing. Under surface of both wings as far as the median line strongly black-dusted, some further dusting beyond the postmedian on forewing. Lines very black and thick. A ♂ taken by Dr. *CHAPMAN* in the Val d'Herens, Valais (elevation not recorded) and now, through his kindness, standing in my collection. — Egg laid on its side, oval, almost as wide as long, micropylar end rather wider than nadir; slightly depressed on greater part of upper surface; surface covered with very strongly-marked polygonal reticulation, which is regular and less coarse than in some allied species. Pearly grey, becoming darker, the reticulation becoming blackish. Larva short, attenuated anteriorly, rugose, moderately carinated laterally, segmentation distinct; head small, brown; body dark clay-colour; dorsal line fine, pale, uninterrupted, edged with brown; subdorsal fine, brown, slightly flexuous; lateral line fine, pale, uninterrupted; spiracles whitish; not dark-ringed; below them, on the 2.—6. abdominals a large brown spot; ventral surface with a double

pale line. A mountain species, inhabiting the southern Alps, Central Italy and N. Hungary in July and the beginning of August.

Pt. muricata *Hufn.* (= *auroralis* *Schiff.* = *variegata* *F.* = *sanguinaria* *Hbn.* = *auroraria* *Bkh.*) *muricata*. (4 b). On account of the bright coloration, and its unusual arrangement, this species was separated by STEPHENS as a distinct genus, under the name of *Hyria*, and in this he was followed by some later systematists; but as the name of *Hyria* was preoccupied, *Anthyria* *Warr.* has been substituted for it. I cannot, however, find any structural characters on which to separate it, and am satisfied that it is a true *Ptychopoda*. In the typical form the bright yellow ground-colour is rather broadly obscured by purple or rose-colour along the costal margin of the forewing and over nearly the whole of the hindwing, leaving only on the latter a yellow central patch, and there is further a purple or rosy suffusion accompanying the postmedian line of the forewing; the fringe remains yellow on both wings. Forewing with a rosy or purplish antemedian line, both wings with a blue-blackish postmedian line parallel to the distal margin. Under surface similar but rather less bright and with a tendency to develop on the forewing a purplish basal suffusion, while on the hindwing the yellow ground-colour is in general less suffused with purple than above. The form from E. China and Japan is smaller, and perhaps requires to be named as a separate local race; but it shows otherwise no constant difference, though I have not seen quite the most extreme aberrations from those localities. Everywhere variable in the extent of the purple markings, but only the two extreme forms require designation. — ab. *lutescens* *ab. nov.* has the purple or rosy colour restricted to a narrow costal border on the forewing *lutescens*. and narrow distal band of both wings. It was figured by KÜHN as long ago as 1774 ("Der Naturforscher", Stück 3), but this figure was not, so far as I can find, provided with a name by GOEZE. The form occurs sparingly in several localities. — ab. *totarubra* *Lambill.*, shows the opposite extreme, both wings being en- *totarubra*. tirely purplish, except that usually a small yellow spot remains in the centre of each wing. The fringes are also yellowish, though less bright than in the type. The form is interesting because it tends in one or two localities to become a local variety. In the bogs of the north of England, at least, it is the prevalent form, even the less extreme examples having more of the purple colour (and this colour rather duller) than the typical, South British form. *Pt. muricata* is locally common in Europe, though not reaching the most northerly or most southerly parts; occurs also in Armenia, across China, and in Eastern Siberia, Korea and Japan. It inhabits marshy or damp places and, like many brightly-coloured species, is fond of flying in the sunshine, although the time of day seems to vary in different localities. It also flies at night, and may then be attracted by a strong light. The larva is moderately slender, rather rugose, tapering anteriorly; head small; body brown or grey, anteriorly and posteriorly more ochreous; dorsal line double, blackish, very fine and faint anteriorly, thickening into a series of paired curved dashes on the 2.—6. abdominal segments; spiracles black; ventral surface darker than dorsal, with a pale central line. Pupa slender, cylindrical, smooth; dull pale ochreous, the wing-cases outlined in black. Imago June—August. Probably earlier in the warmest localities; I have a specimen from the Chusan Islands dated 29 May. ♂ antennal joints thickened, with long ciliation; hindleg slender.

Pt. dimidiata *Hufn.* (= *scutulata* *Schiff.* = *scutata* *F.* = *lividata* *Haw. nec Cl.*) (4 c). An easily *dimidiata*. recognized species, especially if the structural characters be taken into consideration. In general the series of dark spots (sometimes somewhat confluent) in the posterior half of the distal area of the forewing, but never extended to the anterior half, are quite distinctive; and even if occasional aberrations of other species should approach this pattern, *dimidiata* could still be separated by the shape of the hindwing, which has the distal margin somewhat concave between the radials and again between the second median and the anal angle; in the ♂ also by the antenna, which has the joints angularly projecting and the fascicles of cilia strong. Hind-tibia in ♂ short, fringed with hair; tarsus over one-half its length. Only moderately variable, chiefly in size and in the degree of development of the distal blotches. The ground-colour, normally whitish ochreous, is occasionally almost white and occasionally somewhat tinged with reddish. — ab. *delictata* *ab. nov.* entirely *delictata*. lacks the characteristic dark distal blotches of the forewing, the distal area being uniform throughout, with the subterminal line scarcely indicated by faint shading on either side. Except in the shape of the hindwing and in the dentate-fasciculate ♂ antenna this form rather recalls a large *extarsaria*. A rather extreme example of it is figured by BARRETT, from the Porritt collection, with the lines more broken up into dots. — *roseata* *Trti.* is a rufescent or rosy form which has just been described from Sardinia; the black dots are *roseata*. minute but distinct; the blotch near the anal angle is suffused with violaceous. Aritzo in July and bred in September from ova. — The egg of *dimidiata* is oval with minute depressions on its surface; it is whitish at first, changing to a reddish colouring later. The larva is slender, flattened, tapering anteriorly; skin rugose, transversely folded, lateral carination developed; pale ochreous with double dark dorsal line which is faint anteriorly (except on the head), strong posteriorly; subdorsal line brown, on middle segments indicated only by pairs of dots at the incisions; on the 1. to 5. abdominals pale oblique lines between the dorsal and sub-

dorsal; lateral ridge whitish, spiracles black; ventral area suffused with blackish. Polyphagous and fond of withered or mouldy leaves. Pupa shining yellowish, anal extremity darker. The moth appears in June and July, a partial second brood later. Bred specimens of the second brood are more tinged with reddish. It hides among hedges, bushes or other herbage by day and is very easily disturbed, but is sluggish, refusing to fly far and sometimes prefers to drop or flutter to the ground. In the evening it is more active, and will occasionally visit the sugar which is spread for Noctuids. Distributed through the greater part of Europe, Asia Minor and Syria and eastward to Transcaspia.

maderae.

Pt. maderae Baker (5 b). Described from the ♀, the ♂ not quite certainly known. From the shape of the hindwing, however, and the slightly projecting joints of the ♀ antenna, I very strongly suspect that the ♂♂ described below belong to it. In that case it is evidently a very near relative of *dimidiata*; but whether or not, it cannot be referred to *rufaria*, as has been done by STAUDINGER and WARREN. In the ♀ the forewing is shaped and coloured about as in *rufaria*, the first line obsolete, the median not very strong, placed further beyond the black discal dot; postmedian fine, placed nearer the distal margin than in *rufaria*, strongly bisinuate, the proximad curves occupying the normal positions, some dark dots or dashes punctuating the line where it crosses the veins; fringe rather pale, with more or less distinct blackish dots opposite the veins. Hindwing rather longer than in *dimidiata*, subcrenulate and with the same two concavities as in that species, though sometimes rather slight; all the markings as on the forewing, the median shade preceding the discal dot (in *rufaria* this line, not being oblique, is about equidistant beyond the dot on both wings). Under surface less ochreous, forewing more suffused as far as the median shade, paler beyond, hindwing paler; both wings with the postmedian line developed, the cell-dots larger than above. The ♂♂ which I incline to associate with these ♀♀ are smaller and rather shorter-winged and lack the ochreous tone, in all these respects more nearly approaching *dimidiata*; I think they must be the insect referred to by BAKER as Madeiran *dimidiata*, but if so this author must have overlooked the fact that the antennal joints are further extended into true (though quite short) pectinations, an extremely exceptional occurrence in this genus; there are also several other differences. Hindleg similar, the tarsus perhaps slightly shorter. Postmedian line more strongly dark-spotted on the veins than in the ♀, a series of dark spots proximally to the pale subterminal. Madeira. —

unostrigata.

ab. **unostrigata** Baker (5 e) is, so far as at present known, a unique form, and it is not surprising that its author did not recognize its specific identity with *maderae*. The types of both, and of the other interesting Acidaliids in his collection, have been very kindly lent by their author for figuring. The ab. *unostrigata* — a ♀, not a ♂ as accidentally stated in the published description — has the ground-colour clearer ochreous than the types, not mixed with reddish; the postmedian and subterminal lines are obsolete, the cell-spots on the contrary somewhat enlarged and the median shade much stronger and thicker, dark fuscous, placed somewhat nearer to the base on both wings than in the type, thus passing proximally to the cell-spot on the hindwing. The dots on the fringe are strongly expressed, though not enlarged. Beneath similar, the forewing only slightly suffused, the hindwing whiter, both wings in addition with very faint indications of the postmedian line.

zargi.

Pt. zargi Baker (5 e). Only known in a single ♀ example, the exact position in the genus somewhat uncertain. Except in its larger size, more weakly crenulate distal margin of the hindwing and apparently less projecting joints of the antenna it might be said to bear nearly the same relation to *maderae* as the ab. *diffuata* bears to *deversaria* H.-Sch. or *biselata* ab. *fimbriolata* to ab. *extincta*. The underside and the position of the markings above are quite similar to *maderae*, but the basal area of the forewing above, with the entire distal area of both wings (excepting the subterminal line) is filled up with dark smoke-colour. The fringes are defective, but I cannot find any indication of the dark dots of *maderae*. The extremities of both antennae (which would have shown the subserration more distinctly) are broken off, and I am not absolutely certain that the part which remains differs essentially from the corresponding part in *maderae*. The possibility is therefore not at present altogether precluded that *zargi* may be another form of the very variable *maderae*. Madeira.

subsaturata.

Pt. subsaturata Guen. (= *miserata* Stgr. = *subherbariata* Rössl.) (4 c). Similar in shape and structure to *dimidiata*, but with both wings projecting somewhat more in the middle. Considerably smaller, more ochreous-brownish, median shade better developed, postmedian of hindwing more strongly excurved in the middle; the shading distally to the postmedian line quite different, nowhere very intense, but more uniform throughout, consisting of three pairs of spots, sometimes united into a band, bounded by a broad pale subterminal line which encroaches strongly between the radials; the space between the subterminal line and the distal margin is often as pale as the line itself, resulting in the formation of a marginal pale band. Under surface similar, forewing more suffused basally, without first line. Egg ovoid, truncate at the ends, the surface regularly marked with small longitudinal depressions; yellowish at first, becoming redder. Larva elongate, tapering anteriorly from about the fifth abdominal, rugose and granulated, segmental incisions well marked, lateral ridge well deve-

loped; head very small; colour variable, brownish or greenish; dorsal line blackish, double, accompanied by a triangular dorsal pattern; lateral ridge pale; setae thickened at their extremities. Pupa little elongate, greenish brown, head darker, wings prominent, abdomen more reddish, spiracles dark brown. — ab. *lecerfiata* *Homb- lecerfiata.*
berg (= *brunneofasciata* *Andreas*) (3 f) has a slightly more reddish tone, the lines (especially the median) less strongly expressed, the dark shading in the distal area, on the other hand, very much intensified and showing again (though a little less strongly) distally to the subterminal line, which appears a little narrowed. The distal margin of the hindwing seems to project rather less strongly, and the postmedian line similarly to be somewhat less excurved in the middle, and altogether the aspect is that of a separate species. *ANDREAS* and *HOMBERG* have proved, however, by breeding experiments, that this is not the case, and one is inclined to regard it as a Mendelian form, although a certain number of examples are more or less intermediate in aspect. *ANDREAS* obtained from eggs of the type form a brood consisting entirely of ab. *lecerfiata*, while a pairing of this brood resulted in 65% of *lecerfiata* 14% of ordinary *subsaturata* 12% with the band pale, 9% with the band developed but very narrow. If the latter be regarded as a modification of *lecerfiata* and the former of *subsaturata* we get 74% : 26%, or very closely the Mendelian ratio, the aberration being, as is usual, the Mendelian "dominant". *subsaturata* occurs at one locality in S. France (Cette) and is distributed in Spain and Algeria. The form *lecerfiata* is only yet known from Algeria. There are, at least in captivity, three broods in the summer.

Pt. spissilimbaria *Mab.*, briefly diagnosed on a single specimen from Algeria, without more exact *spissilim-*
locality, is a problematical species, and it is doubtful whether it can be certainly identified from the published *baria.*
information. As *STAUDINGER* has altered the description of the colour, I suppose he has examined *MABILLE*'s type, and perhaps the fact that he places it next after *subsaturata* indicates that he noticed a resemblance to that species; if so, it might even be an extreme development of the *lecerfiata* form, which was at that time unknown. In any case it is likely to represent an aberration or variety; apart from *STAUDINGER*'s indication I should have thought it possible that it represented *extarsaria eriopodata*, earlier described by *MABILLE* as *atromarginata*. *spissilimbaria* is described as whitish rufous (by *STAUDINGER* as dirty ochraceous) with the base a little darkened, an ill-developed angled median line and the distal area of both wings very broadly violaceous blackish, the proximal edge of this border bisinuate. Under surface whitish in basal half, blackish in distal.

Pt. foedata *Btlr.* (= *salutaria* *Chr.*) (4 c). Coppery brown with almost straight median and strongly *foedata.*
sinuate postmedian dark lines, the forewing in addition with a slightly curved antemedian line. Cell-spots blackish, that of the forewing nearly always placed on the median line, hence sometimes not very apparent; that of the hindwing on or a little distally to the median line. The area between the postmedian line and the distal margin almost always contains some dark shading, but this varies greatly in extent; sometimes it is confined on the forewing to a small blotch at the anal angle, more frequently it suffuses the entire posterior half and not rarely the whole of the distal area; the latter, according to the description, is *CHRISTOPH*'s form; on the hindwing the dark shading is oftener weak, or confined to small patches near the angles. Distal margin with not very conspicuous dark dots. Underside rather paler, without the first line and the distal shading. ♂ antennal joints projecting, with rather long ciliation; hindtibia rather thick, tarsus as long as tibia. *BUTLER*'s type and another from Tokio are rather dark, but there is in general very little variation in the ground-colour. Widely distributed in Amurland, Korea, China and Japan and reaching Formosa. June to August.

Pt. salubraria *Stgr.* is described as similar to *foedata*, and indeed its author thinks it is even possible *salubraria.*
that it might represent the summer brood of that species; but as he states that the ♂ antennal ciliation is "short, much shorter than in *salutaria*" I do not consider that the union is possible. Light clay-yellow with black discal dots, the forewing with 3, the hindwing with 2 reddish transverse lines, both wings with somewhat darker, violet-grey distal border. The ground-colour is sparsely irrorated with blackish. The lines, as in the previous species, variable in their form and position; the discal dot is placed shortly before the median line of the forewing, beyond it on the hindwing. The third (postmedian) line is darker posteriorly and the violet-grey distal area is here the most pronounced on the forewing; on the hindwing it is well developed throughout. The underside is glossy light-grey, the first line wanting, the median line of the hindwing faint. The legs and palpus seem to agree with those of *foedata*. Differs strikingly from that species in the much lighter, yellowish ground-colour and the reddish (not dark) lines. Sutschan district, Ussuri.

Pt. proximaria *Leech*, (7c) described as a *Chrysocraspeda*, is distinct in aspect from all the Northern *proximaria.*
and Western Palearctic species, slightly recalling some species of the Neotropical genus *Hamalia*. Yellowish light brown, the costal margin of the forewing darker purplish brown, antemedian lines obsolete, postmedian sinuous, marked by blackish dots on the veins; distal margin narrowly dark purplish brown, fringe spotted with the same opposite the veins, both wings with black discal dot present, that of the forewing with some

vague dark shading posteriorly to it. Hindwing slightly bent at 3. radial. Under surface slightly paler, the line better marked, the distal border narrower and paler. Moupin in July. Very similar to *Chrysocraspeda marginata* Swinh., which however, although it will require generic separation from true *Chrysocraspeda*, differs from *proximaria* in the absence of the areole and is also smaller with less acute apex of forewing. ♂ antenna with moderate ciliation; hindtibia dilated, with strong hair pencil; hindtarsus much broadened and flattened. ♀ unknown, so that the generic position is not quite certain, but an apparently very close relationship, both superficially and structurally, to *Pt. protensa* Btl. and the Australian *Pt. coercita* T. P. Luc. gives us full confidence in referring it here.

protensa. **Pt. protensa** Btlr. (7c) is much smaller than *proximaria*, the forewing more produced apically, the distal margin faintly concave in the anterior half. The antemedian line of the forewing is present, though fine, and both wings show a moderately thick median shade, that of the forewing touching the cell-spot, that of the hindwing considerable before (proximal to) it; the postmedian is slender, not broken up into dots, outcurved from costal margin to first radial, there angled and thence rather near the distal margin, sinuous; the dark distal-marginal line on the forewing is accompanied proximally by small irregular spots or suffusion. Beneath similar, with a slight dark suffusion in the basal part of the forewing. The vertex of the head is white, while in *proximaria* it is concolorous with the wings. Hindtarsus abbreviated, its first joint broadened and flattened. The only specimens known to me are 2 ♂♂ from Dharmasala (type and cotype) and a ♀ from Simla (taken in August, at above 2000 m elevation).

amplipennis. **Pt. amplipennis** Btlr. (7c) is similarly coloured and marked to *protensa*, so similar, indeed, that BUTLER determined a rather worn ♀ as "*protensa*?" The ♂, however, is extraordinarily different in shape, the forewing having developed an enormous lobe on the posterior margin, which increases the width of the wing by nearly one-half. In both sexes the distal margin of the hindwing is less strongly convex than in *protensa*. The ♂ is of a brighter yellowish ochreous tone than the two preceding, especially on the forewing. Antemedian line weak, median shade wanting, postmedian in the ♂ strongly waved, in both sexes forming a deep sinus proximad in the submedian area. The dark distal shading is more diffused throughout the distal area of the forewing (especially in the ♀) and the hindwing is also strongly dusted in its distal area. Dharmasala; I have seen only the type ♂ and the single ♀ which is referred here by HAMPSON.

impexa. **Pt. impexa** Btlr. (7c) is a small species, though normally a little larger than *nielsenii*, with which it has something in common. Glossy light yellowish brown with a slight reddish tinge, the costal margin of the forewing reddish or purplish fuscous from the base to well beyond the middle, gradually becoming lighter. Discal dots present but very small, usually not very strongly darkened. Lines almost entirely obsolete on the upper surface, the commencement of median and postmedian often indicated by costal spots, the median occasionally faintly traceable as a curved reddish or greyish line; a reddish brown or dull purplish band of rather less than 1 mm breadth at the distal margin of both wings, touching the margin in the posterior half but receding from it slightly in the anterior, so as to leave a narrow space of the ground-colour beyond it. Fringes light like the wings. Under surface rather paler, more strongly marked, the median shade and a fine, somewhat sinuous postmedian line usually rather well developed. Varies slightly in the width of the marginal band, which occasionally widens anteriorly so as to obliterate the pale distal space, or curves somewhat so as to rejoin the distal margin at the apex. ♂ antenna with long fascicles of cilia; hindleg rather long and slender but the tibia strongly clothed with hair. Smaller than *jakima*, rather duller coloured, the distal band narrower and much more uniform. Japan: distributed, Yokohama to Satsuma, May to the beginning of July; Szechuan: Chungking, a small ♂ 10 September, evidently of a second brood.

jakima. **Pt. jakima** Btlr. (5b). Pale brownish ochreous, slightly dusted with pink scales, the costal margin of the forewing rather darker and more strongly mixed with pink; the inner and median lines pink, not very distinct, the former (confined to the forewing) rather strongly curved, the latter on the hindwing placed well proximally to the discal dot; postmedian line much darker, sinuate, placed rather near the distal margin and standing on the proximal edge of a purplish border; this border on the forewing contains remnants of the ground-colour at the apex of the forewing and is mixed with some olive-grey scales posteriorly, especially towards the hinder angle; both wings with small blackish cell-dot. Under surface similar but rather duller and more weakly marked, the pink and purplish replaced by greyish and including a suffusion in the basal half of the forewing. — In ab. *obliteraria* Leech the lines are obsolete on the upper surface, the purplish distal border weaker and less definite. Described from a single ♀ taken on Satsuma in May. It has since been recorded from other localities by STAUDINGER. *jakima* is distributed in Japan, Korea, the Ussuri district and Central China, July to September. From the similarly (but rather more brightly) coloured *ostrinaria* Hbn.

it differs essentially in the narrower distal area, especially in the anterior part of the forewing and on the hindwing, where also it is more sharply defined. ♂ antenna with fascicles of long cilia; hindtarsus not abbreviated.

Pt. roseolimbata *Pouj.* (5 d). Pale straw-colour with the costal margin of the forewing (as far as the subcostal) and a broad distal border to both wings of a beautiful rose-pink, the former with some dark dusting, the latter traversed by a usually much interrupted subterminal line of the ground-colour and usually also more or less marked with the ground-colour at the distal margin. Lines wanting, or the postmedian very faintly indicated as a sinuous proximal edging to the pink border. Cell-dots blackish, quite small. Under surface duller, the bordering being grey with only a very slight admixture of pink, and the forewing being more or less suffused with the same grey basally; postmedian line better defined than above. Varies only in the extent of the straw-coloured markings in the pink borders, which may occupy nearly the whole of the space between subterminal line and termen, or may be much more restricted. ♂ antenna with long fascicles of cilia; hindtibia short; tarsus not abbreviated. Apparently distributed in the mountains of W. China at elevations of 1500 to above 3000 m, occurring in June and July. A very beautiful and very distinct species, being larger than the allies and with broader, brighter margins. *roseolimbata.*

Pt. nielseni *Hedem.* (= *latimarginata* *Warr.*) (3 f) is smaller than the other rosy-margined species, the borders, as in *roseolimbata*, broad, but their colour less bright, more as in *jakima* *Btl.* Ground-colour pale yellowish straw-colour, the costal margin of the forewing purplish pink. Both wings with dark purplish discal dot and dark bisinuate postmedian line to which follows the purplish pink border, which is partly interrupted with the ground-colour at the distal margin itself. Forewing in addition with a weak or obsolescent antemedian line. Underside similar, the costal margin and sometimes the entire cell of the forewing rather more suffused. ♂ antennal ciliation moderately long; hindtarsus not abbreviated. Amurland, Central China and Japan, showing no geographical variation. WARREN in renaming this easily-recognized little species must have overlooked VON HEDEMANN'S description. From *roseolimbata*, apart from its much smaller size and less bright colouring, *nielseni* differs in having the postmedian line better expressed, more deeply sinuate and feebly dentate. *nielseni.*

Pt. manicaria *H.-Sch.* (= *volitaria* *Joan.*) (4e) is at once distinguished from *nielseni* by its brown, not purplish distal border, but also differs in other respects. The wings are not very broad, the apex of the forewing rather sharp, the distal margin slightly flexuous, being more convex in the middle than anteriorly. Ochreous light-brown, coarsely irrorated with reddish brown; lines reddish brown, the antemedian (present on forewing only) curved somewhat in S-shape, the postmedian slightly curved, followed by an ill-defined dark (red-brown) shade, which bounds the subterminal line proximally; cell-spots redbrown, rather variable in size; median line finer and weaker than the others, placed distally to the cell-spot on forewing and proximally on the hindwing. Under surface similarly marked. Local, Spain and N. Africa. I have only seen ♀♀. *manicaria.*

Pt. fractilineata *Zell.* (= *inclinata* *Led.*) (4 c). Forewing whitish, strongly mixed with pale clay-colour which usually (as in the specimen figured) leaves only a narrow and ill-defined antemedian line, a broader postmedian, closely followed by a very fine, little noticeable line, and rather irregularly bent subterminal of the pale colour; cell-spot black; fringe with some obscure, sometimes nearly obsolete dark marks. Hindwing shaped nearly as in *dimidiata* (the excisions not shown in our figure); usually more whitish and more weakly-marked than the forewing, at least in its proximal part; sometimes more nearly agreeing with it; cell-spot small and indistinct, occasionally wanting; a strongly bent subterminal line nearly always discernible. Under surface more weakly marked. Although I have before me for examination scarcely a dozen specimens of this species these are sufficient to indicate that it is subject to considerable variation in size, colour and markings. Some examples are much smaller than the one figured, the tone is sometimes greyer, while there is not infrequently a more or less distinct dark band (occasionally very strong) proximally to the subterminal line and some weaker dark shading distally to it. In the most strongly-marked specimens there is some coarse fuscous dusting in the basal area and distinct fuscous antemedian and postmedian line are present, the latter being an accentuation of the clay-coloured line which separates the whitish band from the whitish line that follows it. But notwithstanding this variability and the fact that it is a rather inconspicuous species, *fractilineata* is really not difficult to recognize if the shape of the hindwing, the structure, and the course of the subterminal line (which is strongly outcurved behind the middle) be taken into consideration. ZELLER'S type and a few other examples show all the lines present though without the fuscous shading, the postmedian of the hindwing almost right-angled on the 1. radial. ♂ antennal joints somewhat projecting, with slender fascicles of moderately long cilia; hindleg short and weak, tarsus abbreviated. S. Spain, Sicily, Algeria, Egypt to N. Syria. April-June, probably throughout the summer. — *subrufaria* *Stgr.* may probably be only a form of *fractilineata*. *fractilineata.* *subrufaria.*

neata; at least I can find no valid difference in a pair from Tunis kindly sent me by Herr PÜNGELER, who has bred it from the egg and who also considers it doubtfully distinct from *fractilineata*. According to STAUDINGER the lines of the forewing are usually present, but occasionally very weak, the band before the subterminal line nearly always developed, the hindwing also with the lines generally present, but not sharply expressed. He mentions the similarity of structure to *fractilineata*, but fails to give his usual valuable comparative descriptions or differentiations, and the characters which he gives would be equally applicable to certain *fractilineata*. I can therefore only apply the name to the strongly marked forms of that species occurring in Algeria and Tunis.

lobaria.

Pt. lobaria Chrét. is described as being near *fractilineata* but with the ♂ antenna "strongly pectinated". Authors do not all apply this term in precisely the same way, and from the detailed description I gather that CHRÉTIEN only refers to projecting joints with strong fascicles of cilia. According to CHRÉTIEN the forewing is a little prolonged apically, very pale clay-colour with sparse dark brown dusting, the lines weak, especially the inner, median shade vague, narrow, subterminal line whitish, more distinct than the other markings; hindwing with the excision between the radials very deep, leaving a broad lobe on either side, colour whitish at base, then pale clay-colour with whitish subterminal line. Underside similar, but with the lines and especially the discal dots much more distinct. Larva short and thick, carinated laterally, attenuated anteriorly, beginning from the fourth abdominal, and posteriorly, beginning from the sixth; segment-incisions rather pronounced; skin transversely folded, rugose, granulated; reddish ochreous, dorsal band reddish brown, becoming thicker and blacker at the incisions, weaker between; subdorsal similar, but still more interrupted; lateral ridge pale yellowish, slightly rosy; tubercles and spiracles indistinct, setae very short. Feeds in July on fresh or withered leaves. Imago in May and June, probably again later. Algeria: Biskra.

subpurpurata.

Pt. subpurpurata Stgr. (3 f). Another of the very small species, the only ♀ known to me much smaller even than the figured ♂. Ground-colour deeper and brighter than in *manicaria*, but not quite so bright as in *exilaria*; both wings with the area distally to the postmedian line uniformly darker (more inclining to purplish) excepting a fine line immediately adjoining the postmedian and a less fine, undulate subterminal, which both remain of the ground-colour. The lines also purplish, the first (on forewing only) and median sinuous, sometimes near together, the median rather thick, the postmedian following a similar course to the median or rather more strongly outcurved in its anterior part; no distinct cell-spots; fringes unmarked. Under surface similar, forewing without first line. ♂ antennal joints somewhat projecting, ciliation not very long; hindleg short, tarsus extremely abbreviated. Syria, Tarsus and Mesopotamia. Rather variable in the degree of development of the distal shading. Hindwing not at all concave between radials and posteriorly, merely straighter (less convex) than the intervening part.

sanctaria.

Pt. sanctaria Stgr. (7 c) is only known to me from the figure and description, but should be quite easy to recognize, unless it is more variable than is yet known to be the case. Size of *subpurpurata*. Deep ochreous, with sharp black discal dots, before which are placed on the forewing two on the hindwing one black line, on the latter also some dark basal dusting; the distal of these two lines of the forewing and the single line of the hindwing (i. e. the median of both wings) are angled outwards about the third radial. A curved postmedian line commences at the costal margin of both wings shortly beyond the discal dot, but is incomplete. In the hindwing, the second subcostal vein is very long-stalked. Under surface uniform shiny clay-yellow with the costal margin of the forewing narrowly ochreous. Sometimes, at least in the ♂, the proximal black lines are more or less obscured by dark dusting. Valley of the Jordan, Palestine, in May. Compared with *helianthemata* Mill., but the ♂ antennal structure as in *subpurpurata*.

exilaria.

Pt. exilaria Guen. (= *transmutata* Rbr. = *esterelata* Mill.) (4 a, as *filacearia*; 4 c) is usually of a rather bright reddish fulvous, the markings rather darker, more brownish or more purplish; the most distinctive marking is the sinuous distal band, occupying on the forewing the space between the postmedian and subterminal lines and of equal width throughout, and on the hindwing more ill-defined. Well-marked specimens, such as the example we figure, represent GUENÉE's type and have the inner and median lines present, formed nearly as in *subpurpurata*. ♂ antenna with fascicles of long cilia; hindleg short and weak, tarsus greatly abbreviated. All the figures known to me show this form, the dark band either brownish fulvous or purplish to blackish. GUENÉE knew also the weakly marked form and seems to be approximately right in treating it as characteristic of the ♀. — ab. **gynochromaria** Homberg is an extreme ♂ aberration of yellower (less reddish) colour with the markings obsolete both above and beneath. — Larva very distinct from most species, more cylindrical, of medium thickness, without lateral ridge, head large, dark, a dark prothoracic plate, body

gynochromaria.

whitish, tubercles black, setae more conspicuous than usual. Polyphagous on flowers. Pupa amber yellow, not described. The moth is only partially double-brooded. S. France, Spain, N. Africa and Syria.

Pt. fatimata Stgr. (4 c). Shape and structure of the preceding, generally somewhat smaller and paler, *fatimata*, but very variable, the distal band on the forewing straighter, on the hindwing more sharply defined, at least proximally, the postmedian line being well expressed and separated from the band by a fine pale line. Sometimes the band is extended so as to occupy almost the whole distal area, but commonly it is narrow. In general the colouring somewhat recalls *Emmittis* and *Cleta*. ♂ antennal ciliation moderately long. Larva moderately long, attenuated anteriorly, rugose, folded dorsally, shiny greenish or yellowish grey, tubercles small, black, setae longer than usual, no very distinct markings. S. Spain and Algeria in April and (at least in captivity) a second brood in July.

Pt. eburnata Wocke (= *contiguaria* Hb. nec *Bkh.*) (4 c). We here commence a new group, in which *eburnata*, the species bear a more or less close superficial resemblance to the *marginepunctata*-group of *Acidalia* and the genus *Glossotrophia*; this resemblance is certainly in part brought about by the similarity of resting-habits, rocks, stones or walls being chosen in preference to the shelter of bushes. The usually whitish ground-colour, often with dense dark dusting, subterminal line twice broadening, accompanied proximally by pairs of dark spots or an interrupted band are characteristic. The very irregular course of the median shade is generally distinctive of *eburnata*. The under surface is more weakly marked, the first line of the forewing absent, the hindwing whiter than the forewing. ♂ antennal joints swollen, with rather long ciliation; hindtibia not very strongly thickened, with a slender hair-pencil, the tarsus not much shorter than the tibia. Varies considerably; some aberrations, tending to develop into local races in particular localities, have been named. — ab. **obscura** Fuchs differs from the type form in having almost the entire surface of both wings (except *obscura*, the subterminal line) strongly dusted with dark scales, giving to the insect an appreciably darkened appearance. In the type form the dusting is rather sparse. This dark form is prevalent in the Rheingau and is also well known in North Wales. It seems to be topographical rather than geographical, being dependent on the colour of the rocks on which it rests. — ab. **fuscata** Fuchs is the extreme melanotic development of *obscura*, *fuscata*, uniformly infuscated, the markings sometimes almost entirely obliterated. — ab. **dirutaria** Fuchs is *dirutaria*, a weakly-marked yellowish form, the dark dusting very slight, the lines obsolescent, chiefly indicated by the dark costal spots from which they start, some dark dusting proximally to the subterminal. This aberration and the preceding were obtained chiefly by breeding and — like ab. *obscura* — FUCHS records them from his own district, the Rheingau. STAUDINGER writes of ab. *fuscata* "forma domestica", but FUCHS points out (Stett. Ent. Zeit., vol. 62, p. 133) that this is not entirely correct, as he has occasionally, although rarely, taken it wild. The matter has been further discussed by F. FUCHS (Soc. Ent., vol. 19, p. 17). Also in Britain these extreme forms have occurred. — ab. **pallidaria** Fuchs is rather small and narrow-winged, paler, weakly *pallidaria*, dusted, the lines sharply expressed. Described from Spain, possibly a local race. — The egg is a flattened oval, the surface covered rather regularly with minute pitting; pale when first laid, it gradually assumes an orange colouring. The larva is rugose, moderately stout, gradually tapering anteriorly, the head small, the ventral surface somewhat flattened, the lateral swollen; dorsal area yellowish brown, the abdominal segments with a weak, double dorsal line, swelling out and blackening in the middle of the 1.—5. abdominals; subdorsal line blackest on the thoracic segments; tubercles black. Various foodplants are mentioned by different writers, and in confinement it will, like most of the genus, accept various common weeds; a friend of my own has found the larvae in the wild state on *Cotyledon*, but it is oftenest obtained by rearing from the egg. In captivity a succession of broods may be obtained, but the natural period of flight is from about mid-summer and through July. Local in Central and Southern Europe, but not extending far eastward. The Chinese and Korean specimens recorded by LEECH do not belong here; a ♂ from Chow-pin-sa belongs to the genus, but has rather shorter antennal ciliation, rather shorter tarsus and very strong black spots on the fringe, but as the wings are a little rubbed I refrain from describing it. The two ♀♀ (Chang Yang and Gensan) belong structurally to *Acidalia*, but are not in perfect condition and must await the discovery of their ♂. *contiguaria* is a sluggish insect and is found resting on rocks, chiefly in mountainous country.

Pt. sabulosa sp. nov. (7d). Size of the *seriata*-group (wing-expanse 19—21 mm, English system of measurement), distal margin of forewing smooth, of hindwing almost fully rounded, only a little flattened between the radials and from the first median to anal angle. Face blackish, vertex dirty white, collar brown. ♂ antennal joints not projecting, the ciliation even, scarcely longer than the diameter of the shaft. ♂ hindtibia considerably thickened, with strongly expansile hair-pencil, tarsus extremely short. Dirty whitish, densely dusted with coarse, dark greyish-sandy scales. Markings formed by an accumulation of these scales, perhaps accompanied by a slight suffusion of the ground-colour. Forewing with extreme costal edge dark fuscous; the lines

commencing from stronger and usually slightly enlarged costal spots, the first slightly curved, sinuate inwards in posterior part, accentuated by darker marks on the veins, the postmedian formed about as in *eburnata*, or the teeth slightly less pronounced; median shade thick, distinct at posterior margin but almost or entirely dying out about the cell-spot; pale subterminal line strongly sinuous, moderately dark-shaded proximally and distally; cell-spot large, black; no marginal line; fringe with dark spots. Hindwing similar, first line wanting, cell-spot smaller. Under surface very glossy, without markings; forewing more brownish, hindwing more whitish. Dras, Kashmir, 2 ♂♂, 3 ♀♀ collected in June 1887 by J. H. LEECH. One ♂ is less strongly dark-dusted than the other examples.

humeralia.

Pt. humeralia Walk. (= *cerussina* Btlr.) (7 d). A pretty and very distinct species. Wings rather narrow, whitish ashy (sometimes tinged with ochreous), dusted with fuscous scales, the median area of the forewing and basal half of hindwing, however, almost free from dark dusting; the markings fuscous, arranged nearly as in *eburnata* but with the median shade on both wings quite weak, ochreous, not fuscous; costal margin of forewing from base to first line broadly blackish-fuscous. Under surface without markings, glossy, the forewing with smoky suffusion. Antennal ciliation in ♂ moderate, even; hindtarsus not abbreviated. The shape recalls that of a rather narrow-winged *seriata*, to the average size of which it also approximates; distal margin of forewing strongly oblique, nearly straight; of hindwing very slightly excised between the radials. Dharmasala, Kulu, Simla, etc.

consolidata.

Pt. consolidata Led. (7 d) rather nearly resembles *eburnata* in colouring and markings and it is probably for this reason that STAUDINGER has placed it in this position. It does not approach it very closely in structure, the ♂ antennal joints projecting less, with the ciliation shorter, the hindtarsus in the ♂ greatly abbreviated. Further differs from *eburnata* in the less developed dark costal spots of the forewing, much weaker and less zigzag median shade (sometimes almost obsolete), position of the postmedian line somewhat further from the distal margin, large dark dots near the base of the pale fringes, weaker-marked underside and other characters. In any case the yellower and darker forms of *eburnata* could be at once distinguished by their colour, for *consolidata*, so far as I know it, does not vary greatly but remains whitish. Larva rather thick, tapering somewhat anteriorly, transversely folded, lateral carination sharp; head dark brown, body greenish black-brown, 2.—5. abdominal segments each anteriorly with a somewhat raised whitish yellow transverse dorsal protuberance; the dorsal tubercles on the last few segments placed on yellowish elevations; spiracles very small, brown, the tubercles in their vicinity black. Pupa compact, light brown, the cremaster dark with very short anal hooks. Imago in June—July and again in September. S. E. Europe, N. Syria, Asia Minor and Persia, local. Perhaps also in Sicily, and I have a single ♂ from Moncayo (N. E. Spain) which seems clearly referable here but has become greasy and looks darker — rather recalling the description of *joannisata*.

libycata.

Pt. libycata Bartel (3 f) represents *consolidata* in Algeria, and doubts have even been expressed whether it should be treated as a distinct species, neither the larva nor the perfect insect seeming to show any very important differences. As, however, the ♂ antennal joints appear to be appreciably more projecting, and the costal margin of the forewing more convex, so that the wing appears broader, I prefer to keep it distinct. For the rest *libycata* differs chiefly in being on an average more strongly dark-dusted and better marked, sometimes with a more brownish ground-colour, the antemedian and postmedian lines of the forewing tending to become more nearly approximated, especially at the costal margin. Larva thick, attenuated anteriorly, strongly carinated, segment-incisions deep; skin very rough and granulated, folded transversely; head blackish; a quadrate blackish dorsal spot on the metathorax extending to part of the 1. abdominal, the following segment-incisions with X-shaped dorsal markings; ventral area blackish grey, with a similar but weaker pattern. Double-brooded, or perhaps with a succession of broods. From eggs obtained late in May HOMBERG bred the moths in August.

vesubiata.

Pt. vesubiata Mill. (4 c) is another rather broad-winged species with, in some measure, the *eburnata* habitus. In the antennal and leg structure it nearly agrees with *consolidata*, the ciliation perhaps even shorter. The much less distinct spots in the fringe, together with much thicker, stronger interneural dark marks on the distal margin itself will readily distinguish it from *consolidata*. The median line of the hindwing follows nearly the same course as in *eburnata*, but that of the forewing is in general much less incurved posteriorly, thus less approximated to the inner line. The dark costal spots at the origin of the lines are well expressed. The ground-colour is sometimes browner than in the specimen figured. Under surface with strong lines and discal dots, the forewing somewhat smoky, the hindwing whiter; first line of forewing wanting, the shading between postmedian and subterminal weaker than above. By some error MILLIÈRE has figured the larva of *asellaria* as *vesubiata*. That of the true *vesubiata* is moderately slender, tapering little, somewhat flattened, the lateral ridge

only weak; dorsal area usually of a dark, warm wood-brown, lighter spotted along the lateral ridge, the last segments somewhat lighter with dark middles; the 4 middle segments each with two fine white dots; ventral area darker. The pupa is similar to that of *seriata* but larger, more mixed with greenish, especially the head and wings. The egg is pale lilac or brownish. — *vesubiata* is exceedingly local, being apparently confined to the district of the Maritime Alps, both in France and Italy. It is found sitting on rocks and occurs in June—July; in captivity, perhaps very occasionally in a state of nature, there is a partial second brood.

Pt. asellaria H.-Sch. (= *typicata* Guen. = *reynaldiata* Rouast) (4 c). The name which is in common *asellaria*. use for this species may possibly be incorrect, as HERRICH-SCHÄFFER's figure is scarcely good enough to allow of certain identification and his type specimen was said to come from Corsica, which is not a positively known locality for our species. The name of *reynaldiata* quite certainly represents it, and according to STAUDINGER's examination of GUENÉE's type that of *typicata* (at one time erroneously supposed to be a form of *eburnata*, with which GUENÉE compares it) is equally certain. Nearly always smaller than the four preceding species; only in breeding, as with some other *Ptychopoda*, giant specimens may occasionally be obtained. Distinguishable also by its nearly uniform grey dusting, even the pale subterminal line not being so largely free from dusting as in the allies, hence not so conspicuous. From the same cause the dark shading proximally to the subterminal is not conspicuous. The postmedian line on both wings forms a sharper angle on the first radial than in the allies; only *libycata* sometimes appears rather sharply angled here, but this is when the line is markedly incurved costally, which is not the case with *asellaria*. The postmedian line of the hindwing is nearer to the discal spot, appearing as a continuation of the median of the forewing; only *consolidata* shows even an approach to this arrangement. The cell-spots are always large, especially that of the hindwing. The distal marginal line is broken up into small dashes, but these are not so strongly thickened as in *vesubiata*. The dots on the fringe are variable, but as a rule not nearly so strong as in *consolidata* and *libycata*. Under surface near that of *vesubiata*, the median line rather less strongly expressed. Before all, the ♂ hindleg has retained the terminal spurs, and the species should have been placed in the section *Sterrha* but for its extraordinary affinity with the spurless *alyssumata*. The ♂ antennal ciliation is rather short. — *hornigaria* Stgr. is a much darker *hornigaria*. form from the Tyrol (Bozen), described as of a dark violaceous grey, sometimes almost unicolorous. The few examples which I have seen are probably not among the most extreme which do occur, and although they are quite distinguishable from the normal form they can scarcely be considered very striking. — ab. *ruminata* Mill. seems to me (from the figure) still less striking, though its author calls it a "constant variety", *ruminata*. commoner some years than the type. The ground-colour is a little darkened, the lines strong and thick. — Larva stumpy, attenuated anteriorly, dorsal surface flattened, lateral carination strong; head small; skin rugose and shagreened, the markings appearing to be formed by lighter and darker granulations; colour variable, lighter or darker grey or clay-colour; dorsal line fine and pale, obsolete on last few segments, on middle segments broadest; lateral ridge with a row of large black spots; ventral area with weak, angled markings. Polyphagous, preferring withered leaves. Digne to the Southern Tyrol.

Pt. alyssumata Mill. (3 f). Scarcely distinguishable from the preceding except by the structure of *alyssumata*. the ♂ hindleg, which, though not aborted, always lacks the spurs. Otherwise the resemblance is so exact that it has been placed as a probable variety of *asellaria*. I think that on an average it is somewhat smaller, paler and more yellowish grey, as STAUDINGER indicates, but none of these differences is constant. As a rule, also, the course of the postmedian line is more irregular in *alyssumata*, but it varies appreciably in both species. The under surface of *alyssumata* is in general more weakly marked, with only the postmedian line present, and even this often faint; but I have before me a form of *alyssumata* from the Eastern Pyrenees with the lines extraordinarily strongly expressed above, and in this form the character is reproduced beneath. *alyssumata* seems much the more variable species; from Barcelona I have seen a form in which the coloration is strongly suffused with bright reddish. The egg is rounded, dark fulvous, not fully described. The larva is short and thick, similar in form to that of *asellaria*; in coloration it seems to be much more variegated, the dorsal area vinous reddish, marbled with white, brown and yellowish, each segment with a pale dorsal patch, the 2.—5. abdominals with distinct yellow (in MILLIÈRE's figure white), black-margined spots at the incisions; ventral area uniform dark slate-colour. Supposed to feed on *Centaurea aspera*, but will accept various flowers and leaves. Spain and the Pyrenees, single-brooded, occurring in July—August.

Pt. nocturna Stgr. (3 f). Of this species I only known the single specimen (♂) kindly lent by Herr *nocturna*. PÜNGELER. It is much darker than any form of *asellaria* or *alyssumata* and rather recalls *Glossotrophia confinaria* ab. *falsaria*, from which of course the neuration of the hindwing would distinguish it even if the resem-

blance were much closer. The ground-colour is pale greyish ochreous, but even in the median area, which is the palest, this is so strongly and coarsely dusted with dark chocolate that the latter may almost be considered the prevailing tone. In the basal area this is still more the case, while the broad distal area is almost entirely of the dark colour, though containing (especially on the hindwing) an indistinct sinuous subterminal line of the ground-colour. On the forewing 3, on the hindwing 2 indistinct dark lines, waved or almost angled, rather nearly approximated. Forewing with a rather strong cell-spot placed on the median line; hindwing with smaller, less strong spot. Under surface of a similar but more uniform chocolate tone, the markings obsolete. Antenna with fascicles of moderately long cilia; hindtarsus rather short, scarcely half as long as the tibia. STAUDINGER described this species from a single, somewhat damaged ♂ from Namangan, N. Ferghana, which was perhaps even more uniformly dark than the specimen here described.

striolata.

Pt. striolata *Stgr.* Dark (violet-)grey with black discal dots, an obscure dark median shade and a series of black postmedian dashes continued on the hindwing as a dentate line. Discal dot smaller on forewing than on hindwing, closely followed (almost crossed) by the median shade, which on the hindwing is stronger and precedes the discal dot. On each vein of the forewing proximally to the median shade there are usually a small black dash and dot. Limbal line composed of black dashes; fringe lighter with thick black dots in basal half. Underside of forewing blackish grey, almost unicolorous or with discal dot and 2 indistinct dark outer lines. Hindwing sometimes with broad dark distal border; beneath light grey with the lines distinct. Antennal ciliation in ♂ long, hindtarsus very short. Syria. Unknown to me.

consociata.

Pt. consociata *Stgr.* Somewhat suggests a large *consolidata*, but is quite different in colour, being clay-yellow. Wings dusted with blackish and with black, rather elongate discal spots. Inner line very weak, median shade wanting, postmedian line better expressed, followed by an indistinct band of dark, more or less confluent spots; the figure shows that the postmedian follows a pretty normal course, being incurved in the usual positions. Under surface glossy clay-yellowish with only the discal marks and postmedian line weakly present. Only the ♀ is known, and I have never seen it. Mardin, Northern Mesopotamia.

mauritania.

Pt. mauritanica *Baker* (5 d). Similar in shape and colour to *cervantaria*, but larger. Ground-colour ochreous, inconspicuously dusted with fine darker scales. Forewing with antemedian and postmedian lines slightly greyish but extremely feeble, only a little more noticeable from costa to subcostal vein and thence as dark marks on the veins; antemedian oblique outwards to subcostal, then lunulate between the vein-dots; postmedian angularly broken distally between the subcostal and first radial, then formed somewhat like antemedian; in certain lights a slight darkening midway between the lines indicates towards the posterior margin the position of the median shade; a slightly pale waved subterminal line is discernible, and there are rather distinct terminal dots and some not very distinct dark dots on the base of the fringe; the only prominent marking is the black discal spot. Hindwing slightly paler, at least in its proximal part; no antemedian line, the rest nearly as on forewing. Under surface rather paler, the discal dots obsolescent, the postmedian line on the contrary better expressed, slightly thickened, not stronger on the veins. ♂ antennal joints projecting, with longish fascicles of cilia; hindleg short, the tibia not very strongly thickened, the tarsus less than one-half the length of tibia. Guelma, Algeria, June. I have only seen the type specimen. It may possibly be a large, extremely weakly marked form of *cervantaria*, but the subterminal line does not seem to follow the same course and perhaps a more strongly marked example would reveal other differences in the arrangement of the markings.

metohiensis.

Pt. metohiensis *Rbl.* Also larger than *cervantaria*, but with the wings more elongate, the ground-colour pure white, not yellowish, the markings much finer, in particular with the lines less thickened at the costal margin of the forewing; the central area is somewhat narrower and the dark marginal dashes between the veins are wanting. The markings are brownish, the discal dots black, distinct. The median shade of the wing, which arises about the middle of the posterior margin, unites with the inner line before the middle of the wing. Gacko, Metohia (Herzegovina), resting on rocks in July. Only known to me from REBEL's description. Structure as in *cervantaria*.

okbaria.

Pt. okbaria *Chrét.* Related to *cervantaria*, the collar (as in that species) not darkened, ♂ antenna with very long ciliation, hindtibia not thickened, tarsus long. Yellowish white, strongly dusted with brown. First line represented by a large costal, a small median and a posterior spot; postmedian sinuous and dentate, sometimes marked only by dots on the veins; pale subterminal bordered with brown spots, those on either side of the first median vein the largest, roundest and best defined; median shade very sinuous, fine,

only strong at the costa, where it arises near the postmedian; discal dot sharply expressed, black or blackish; distal margin with an interrupted blackish line; fringe dotted with black opposite the veins. Hindwing without the first line; discal dot placed distally to the median. Forewing beneath infuscated at the base; the lines and discal dots sometimes distinct, especially in the ♀. The egg is ellipsoid, flattened at the sides, with a central depression; surface marked with small irregular shallow polygonal, rounded or oval depressions; white, changing to orange. Larva shaped about as that of *cervantaria*: moderately elongate, attenuated anteriorly from the fifth abdominal, carinated laterally, segment-incisions well marked, skin moderately folded; head small; body with dorsal area ochreous, ventral brown, lines hardly distinct: dorsal very fine, pale, bordered with brown, which widens so as to form dark marks at the incisions and a little beyond the middle of the middle segments; lateral yellowish white, especially distinct anteriorly; ventral fine, pale, edged with blackish brown near the incisions; tubercles not very distinct except the dorsal, which are dark brown; setae very short; spiracles brown-ringed. Feeds on dead leaves and detritus, but seems difficult to rear. Pupa undescribed. Imago double-brooded, appearing in May—June and August—September. Gafsa, Tunis. Only known to me from the description.

Pt. *cervantaria* is a rather variable species, separable into two principal races according to the ground-colour. The form of the wings and the general arrangement of the markings associate it with the preceding group of species, though the forewing is perhaps a little narrower and more pointed than the average. The pale ground-colour is moderately dusted with dark atoms; the lines are present, starting from dark spots on the costa, the pale subterminal is accompanied by some dark shading proximally; the first line is curved, blackest and thickest on the veins; the median inbent posteriorly; the postmedian marked with dark teeth on the veins; cell-spots distinct; distal margin with thick, elongate interneural marks. Under surface more glossy, quite weakly marked. ♂ antenna and hindleg about as in *mauritanica*. The larva is elongate, tapering anteriorly, the head small, the skin-folds marked, the lateral ridge developed; clay-colour, nearly without markings; dorsal band broad, pale ochreous yellow, sometimes darkened on the thoracic and first abdominal segments; lateral line fine and undulate, a little paler than the ground-colour; ventral area more or less strongly slate-grey, with a pale medio-ventral line which broadens on each segment to an elongate lozenge-shaped mark; spiracles small, whitish, encircled with brown. Feeds, at least in captivity, on *Alyssum*. Pupa moderately elongate, generally yellowish green, with the head, abdominal extremity and wing-veins marked in reddish brown. The moth is double-brooded. — ***cervantaria* Mill.** (3 f) is of an ochreous or yellowish tone and is found in S. France (Collioure) and Catalonia. — ***depressaria* Stgr.** (3 f), which represents it in Southern Spain and North Africa and seems the much commoner form, is whitish grey with scarcely any tinge of yellow and thus presents a very different appearance, as is well shown in our figures. This pale form rather nearly resembles some forms of *eburnata* but has the lines weaker, the costal spots not so large and strong, the one at the commencement of the median shade placed rather further distad, the white blotches into which the subterminal line expands not quite so strong, and some other slight differences. *cervantaria.*
depressaria.

Pt. *incisaria* Stgr. (3 g, ♂♀). I have slightly altered the position of this species from that assigned *incisaria* to it by STAUDINGER in order to bring it nearer to *seriata* Schrank, to certain forms of which it bears an exceedingly close resemblance. Coloration and general scheme of markings both above and beneath altogether as in that species. Shape of forewing also very similar, but with slightly sinuous distal margin, foreshadowing the form which becomes so distinctive on the hindwing. Hindwing with distal margin crenulate, strongly excised between the radials and more shallowly between the first median and the hinder angle, which latter sometimes appears slightly lobed. In the markings the most obvious distinction is the presence of a rather large dark costal spot at the point of origin of the median shade on the forewing. A close examination shows also several slight differences in the course of the lines, the pale subterminal of the hindwing in particular tending to follow the bends in the shape of the distal margin. The dark shading distally to the postmedian line is more broken up into spots. Collar not dark-coloured. ♂ hindtarsus very short, much more so than in *seriata*. The ♂ is usually similar to the figured ♀; the figured ♂, lent by Herr PÜNGELER (bred from Biskra), shows an unusually pale aberration. The characteristic incisions in the distal margin of the hindwing are not brought out in either figure. Egg ellipsoid, with regular, rather shallow polygonal depressions, not arranged in lines; whitish at first, becoming blotched with rose-colour. Larva tapering anteriorly, carinated laterally, segment-incisions rather deep, skin moderately folded, hardly rugose except the anterior and posterior segments; ochreous, more or less reddish, with vague brownish lines; dorsal divided by a fine pale line, little distinct even anteriorly; subdorsal better indicated on the first 4 or 5 segments; carina pale yellowish ochreous, followed by a blackish brown band; ventral surface paler clay-colour with a geminate median line forming some small lozenges; tubercles very small, brownish, not prominent, setae very short; head as wide as prothorax, concolorous, but spotted with brown. Feeds on low plants, accepting fresh or withered leaves. Pupa rather short, yellowish grey with rows of dark brown dorsal spots and with dark wing-veins; cremastral bristles normal. *incisaria* was described from Southern Portugal but has since

been taken in some numbers in Algeria, as at Biskra and Philippeville. There is a succession of broods — in captivity certainly three, May—June, July—August, October.

mareotica.

Pt. mareotica Draudt (3 g, as mareotensis) has the hindwing similarly shaped to that of the preceding species but with the crenulations rather more regular, the excision between the radials less deep, the projection at the 3. radial and 1. median less prominent; anal angle produced as in *incisaria*. Wings slightly narrower, less strongly dusted, the costal spot at origin of median line weaker, occasionally even obsolete, the lines of the forewing angled on the 2. submedian, reaching the posterior margin very obliquely as in *calunetaria*, those of the hindwing much less sinuous than in *incisaria*. ♂ antennal joints more projecting than in the allies. Hindtarsus of ♂ longer than in *incisaria*, somewhat shorter than in *albitorquata*. The brownish-grey shade which follows the postmedian line is continuous, or in any case not broken up into spots; it is generally rather well developed, but *mareotica* is rather variable in this and other respects. Some specimens are darker and more strongly marked than the one figured, some paler and weaker-marked. The larva is rather compact, flattened, with prominent lateral carination; almost uniform yellow-grey with quite weak dorsal X-markings crossing the segment-incisions. Mariout Desert, Lower Egypt, probably in a succession of broods. I possess a worn ♂ which was taken at light at Alexandria, 2 July 1904, by Mr. P. P. GRAVES.

albitorquata.

Pt. albitorquata Püng. (3 f). Hindwing still less irregularly shaped, more approaching that of *seriata*. From that species it differs in the whitish collar, the somewhat coarser (though not denser) dark atoms, more conspicuous black marks on the distal margin and also in the structure of the ♂ antenna and hindleg. ♂ antennal joints scarcely at all projecting; hindtibia more swollen, tarsus shorter, more approaching *mareotica*. Until quite recently this species was entirely overlooked, on account of its strong superficial resemblance to the whitish southern forms of the variable *seriata* or to *sodaliara* or *camparia*, all of which have the collar brown. It is on an average somewhat larger in size. Already known from Sicily, Greece, Asia Minor and Mesopotamia, thus has evidently a wide range. Herr PÜNGELER has reared it from the egg. As with *seriata*,

napoleon.

there is a succession of broods, the life cycle being completed in two or three months. — **napoleon** form. nov. (5 b) may possibly be a dark local form of *albitorquata*, but more probably a separate species. Unfortunately only the ♀ is yet known, but this seems to have the antennal joints somewhat more prominently angled at their extremities than *albitorquata*. Smaller, the white ground-colour much more densely dusted with the large dark atoms, the dark markings also much more distinct, indeed more blackish than in the most strongly-marked examples of *seriata* known to me. Antemedian and postmedian lines formed similarly to those of *seriata* but thicker, more continuous, the teeth on the veins thicker and stronger; median shade faintly indicated in light brownish; a series of strong fuscous spots proximally to the subterminal line; distal marginal black strokes on an average even more strongly developed than in typical *albitorquata*. Under surface also more strongly marked than in *seriata*. Corsica: Bastelica, 30 July, 1905 (type, in my collection); Ajaccio, 9 June, 1899 (cotype, British Museum). Herr PÜNGELER informs me that he has also an example, without exact locality. I further learn from him that a very similar form occurs in the mountains of Sardinia which except for the apparent (slight) antennal difference might be referred here and which he inclines to regard as a small dark mountain race of *albitorquata*. Further material is required for a full elucidation of these various closely-allied forms, but the Corsican *napoleon* is so distinct and easily separated from typical *albitorquata*

obliquaria.

that I do not hesitate to call attention to it. — **obliquaria** Trti. After the above was written, and indeed just as we are going to press, the above-mentioned Sardinian form has been described as a new species by TURATI; it will possibly, on side-by-side comparison, prove to supplant my *napoleon*, notwithstanding the apparent difference in the antenna. "Form of *virgularia* Hbn., but smaller than *albitorquata* Püng., between which species it seems to come. Forewing more elongate; colour blackish grey. Transverse lines more oblique, very black, distinct, less dentate; bands (marginal and submarginal) somewhat similar to *albitorquata* Püng.; but with the submarginal from the middle of the wing-margin to the posterior angle dark and broadly diffuse. Hindwing with the submarginal line also diffuse. Under surface smoky, with black lines formed of dashes on the veins. Thorax and abdomen concolorous, dark grey, head lighter, not sharply contrasted with the collar. 9 ♂, 1 ♀ Monte Chiesa, collected in May and June, reared from ova in July and August". According to the discoverer, G. C. KRÜGER, the larva differs from that of *albitorquata*.

joannisiata.

Pt. joannisiata Homberg (= ? *campata* Rbr. nec H.-Sch.) is unknown to me except from HOMBERG's excellent description and the notes which accompany it. It was discovered in 1901 near Vernet-les-Bains (Eastern Pyrenees) but was at first misidentified as *camparia*. If it is really identical with the *campata* of RAMBUR it occurs also in Andalusia, but as the figure shows rather slighter angles in the lines and the median shade removed a little further distad than in *joannisiata* the identity is not established; the Andalusian specimens which I have seen appear to be true *camparia*, but in any case are clearly not *joannisiata*. The latter is distinguished by its *glossy* pale brownish grey colour, strongly different from the coarsely dusted, dirty

white tone of *camparia*, by the position of the lines and especially by the structure. ♂ antenna very shortly and finely ciliated, the ciliation not as long as the diameter of the shaft; hindtibia strongly dilated, with long hair-pencil, tarsus extremely short. Wing-markings blackish brown, consisting of thick, nearly parallel lines, more strongly marked at the margins of the forewing; antemedian angulated, median crossing the discal dot of forewing or approximated to it distally; postmedian punctuated on the veins, forming a very small but sharp angle on the first radial; subterminal line indistinct, not accompanied by the strong spots of *camparia*; fringes intersected by brown marks opposite the veins. Under surface more glossy, forewing somewhat infuscated, hindwing whitish, both with the postmedian line distinct.

Pt. camparia H.-Sch. (4 c) is exceedingly like *seriata* and agrees with it in the dark collar. The *camparia*. wings are slightly broader, strongly dusted and (at least usually) strongly marked. The lines of the forewing arise from well-marked costal spots and the postmedian follows a different course from that of *seriata*, not being appreciably incurved between the radials; it is followed by a more distinct band or series of dark spots proximally to the subterminal and the distal side of the subterminal is also more or less darkened; the distal margin bears a series of conspicuous interneural black strokes, which seem to be always much finer and weaker in *seriata*; dots on the fringe nearly as in that species. ♂ hindtarsus somewhat shorter than in *seriata*. Larva elongate, tapering a little anteriorly and with lateral ridge; head small, deeply bifid, wood-brown; body reddish wood-colour with light dorsal and subdorsal line, beginning on the prothorax as sharply white lines, but only the dorsal continuing white; subdorsal indicated in its further course by dark shading below it; 2.—5. abdominal segments with thick dark spots bordering the dorsal; ventral area darker brown with light markings. Imago double brooded, appearing in June and August. Originally described from Smyrna, occurs in several localities in Asia Minor, Syria, Cyprus, the Balkan Peninsula, S. E. Hungary, Dalmatia and Andalusia; probably Sicily and N. Africa are to be added and perhaps some other localities.

Pt. sodaliara H.-Sch. (4 c) bears to the white forms of *seriata* the same relationship which *camparia* *sodaliara*. bears to the more strongly dusted forms. White with the dusting fine and not strong, the lines, as in *camparia*, arising from well marked dark costal spots, the postmedian on the forewing not curved inwards between the radials, placed rather further from the distal margin than in *seriata*; the dots or dashes on the veins by which it is emphasized are sometimes rather long, giving to the line a dentate appearance. The dots at the base of the fringe are in general smaller and less prominent than in *seriata*, occasionally almost obsolete. The ♂ hindtibia, as in *camparia*, is perhaps somewhat more strongly dilated than in *seriata* and the tarsus is slightly shorter. I regret that I can point to no essential difference from *camparia*; with bred specimens of both before me, kindly lent by Herr FRITZ WAGNER of Vienna, I can only say that the dusting on *camparia* is thicker and coarser, the brown lines also more mixed with dark scales, the subterminal and terminal shading and fringe-dots in general stronger. But for the experience of the Vienna entomologists, who have bred both from the egg, I should not have considered them distinct species. The larva is slender, moderately flattened, anteriorly tapering, lateral ridge distinct; head yellowish brown; body reddish wood-colour dorsally, the middle segments mixed with blackish; thorax and first abdominal with a fine blackish subdorsal stripe; 2.—5. abdominal each with a strong black spot; often a lozenge-shaped pattern is developed on the darkened segments; anal segment with a light, distinctly black-edged dorsal line and very fine subdorsal; lateral ridge light brownish; ventral area blackish brown. According to REBEL it differs chiefly from that of *camparia* in being darker ventrally and more indistinctly marked, the white lines on the prothorax weak or wanting. Pupa light brownish with regular rows of black spots; cremaster dark, with the terminal bristles short. The moth is double- (in captivity triple-) brooded, May—June, July and end of September, each brood in Dalmatia appearing later than the corresponding one of *seriata*. S. E. Hungary, Carniola, Da'matia and the Balkan States; other records are quite doubtful.

¶ **Pt. textaria** Led. (4 d) can scarcely be confused with any other known species. The pure shining white *textaria*. ground-colour and the arrangement of the markings rather recall *Acidalia ornata*. The ♂ antennal structure and the shape of the hindwing bring *textaria* rather near *seriata*; the ♂ hindtarsus, however, is much shorter. Lines slender, the antemedian and median more or less obsolete, chiefly indicated by dots on the veins; all three commence obliquely on the costal margin and are angled subcostally; the postmedian is usually better developed (at least towards the inner margin), lunulate-dentate and twice incurved; distal area with two interrupted brownish bands or series of blotches, bounding the broad white subterminal line; cell-dots present; distal margin with thick black line strongly interrupted at the vein-ends (or series of thick black dashes). Median shade better developed on the hindwing, strongly angled outwards on the radial and median, so as to form a large lunule (almost a semicircle) round the cell-spot. Under surface feebly marked, the forewing with a slight brownish basal and costal suffusion. Apparently common in Syria and distributed from the Taurus to Transcaspia.

coscurata.

Pt. coscurata Mill. (3 g) has been united with the dark forms of *seriata*, but if PÜNGELER has correctly identified it is certainly a good species. He writes me as follows concerning *coscurata*: "The single known specimen, a ♀, came from the small island of Pantellaria (off Sicily), which is of volcanic origin; the present specimens were taken on Mount Etna. MILLIÈRE, who considered the species a *Eupithecia*, has not described and figured it very well; worn specimens however, in which the markings become paler and more indistinct, agree quite well with the figure. I think the determination can be accepted without much hesitation". Structure about as that of *camparia* and *sodaliara*; wings ample, distal margin of hindwing strongly convex, only very feebly excised (or merely flattened) between the radials and from first median to anal angle. Collar deep brown. The deep colouring of the wings on the whitish ground (well shown in our figure) gives it a very distinctive appearance, perhaps only, in this group, approached in *albitorquata napoleon* and *obliquaria*. The antemedian and median lines of the forewing arise from large blackish costal spots, the postmedian from a rather smaller one; the latter follows a course intermediate between *camparia* and *libycata*, being sometimes broken distad along the 1. radial vein. A strong dark band borders the subterminal proximally. A thick black terminal line is interrupted by white spots on the veins. Forewing beneath infuscated, hindwing paler, showing the lines and cell-spot. A succession of broods occurs.

seriata.

Pt. seriata Schrank (= *incanata* Schiff. nec L. = *moniliata* Bkh. nec Schiff. = *virgularia* Hbn. nec *virgulata* Schiff. = *vicinata* Wrnbg.) (4 d). An extremely variable species, ranging from almost pure white forms without markings or with well expressed lines to unicolorous black-grey forms. The vertex of the head remains whitish in all the forms, the collar dark. The lines, when present, do not arise from enlarged costal spots, though not infrequently the costal extremity of the lines is a little blacker than the rest. The first line of the forewing is angled on the subcostal vein or at least strongly bent; it is thickened with dark marks on the veins. The median shade is thicker, not rarely rather strongly developed, often, on the contrary, quite obsolete even in forms in which the lines are sharply marked; it usually touches the cell-spot on the forewing and is always proximal to it on the hindwing. The postmedian is fine and grey, not itself conspicuous but marked with strong, coarse black spots on the veins; it stands rather near the distal margin and is incurved between the radials, then outcurved; the form of this line is best shown on the right forewing in our figure and may be compared to that which occurs in a higher degree of development in *calvina*. The pale subterminal line is slightly more strongly bent (or angled) inwards between the radials; it is often almost indistinguishable on account of the lack of dark shading accompanying it, but the dark shading may also be moderately or even very strong, sometimes almost filling the distal area and forming a dark border to the wings; this dark shading scarcely ever shows a tendency to break up into spots, herein differing markedly from *incisaria*, *camparia*, *sodaliara*, etc.; distal marginal line consisting of a series of black dashes of variable thickness, sometimes almost obsolete; fringe with more or less strong dark dots at base, opposite the vein-ends. Forewing beneath more or less suffused, often dark smoke-colour, the postmedian line and the cell-spot, however, usually well expressed; hindwing beneath white or whitish, marked (or unmarked) nearly according to the upper surface of the particular form. The typical *seriata* of Central and Northern Europe is more or less strongly dusted, thus appearing grey, but includes a wide range of subordinate variation, not only in the intensity of the dusting but also in the expression of the lines, the median shade or the dark

cubicularia.

bordering, either singly or in combination. — ab. **cubicularia** Peyer (= *bischoffaria* Lah. nec Hbn. = ? *afra* Baker) is a unicolorous melanotic aberration, dark grey or blackish with lighter fringes, the under surface, however, but little darker than in the type form. It seems (according to the published and still more extensive unpublished experiments of which I possess information) to be a Mendelian form, interbreeding with the type but with the offspring segregating, not producing intermediates. Best known from Germany and Austria-Hungary, but has occurred in N. Italy, N. England, etc. Last year (1911) two were taken in London. HABICH bred from a ♀ ab. *cubicularia* a very perfect halved gynandromorph, the left side ♂ *cubicularia*, the right

obscura.

side ♀ *seriata*. — ab. **obscura** Mill. (= *grisea* Lah.) (4 d, as *cubicularia*) is suffused with smoke-colour but the markings remain. REBEL has certainly done rightly to separate this from the preceding. It is our

australis.

common London form and in no degree Mendelian. — **australis** Zell. (= *paleacata* Guen. = *canteneraria* Mill. nec Bdv. = ? *calvina* Lah.) is the prevailing form in Italy and indeed in most southern localities. Clear yellowish white, with little or almost no dark dusting, the markings more or less well expressed. It varies greatly in size as well as in the extent and depth of the markings and ZELLER further subdivided it. In any case STAUDINGER's indication of the form *canteneraria* as "much smaller" than *australis* is not entirely correct. Probably there are some localities in which *australis* occurs as an aberration among the type-form, but I am unable to say positively that this is so; certainly in Britain forms approaching it are entirely unknown. — ab.

calcearia.

calcearia Z. is an aberration of *australis* of small size, pure chalk-white ground-colour, the markings in general rather weak, thus approaching in some respects *canteneraria* and *minuscularia*. — **canteneraria** Bdv. (= ? *australis* Z. var. b) is a development of *australis*, in Sicily apparently a mere aberration of it, but it constitutes a local race in the South of France. It also occurs in Dalmatia and no doubt in some other localities. It is a small whitish form, very weakly marked, sometimes almost entirely without markings excep-

ting the discal dots and those on the fringe. — *minuscularia* (*Stgr. i. l.*) *Ribbe*, from Southern Spain and Algeria, is a still more extreme development, smaller, purer white (at least in the ♀), the discal dots minute, sometimes scarcely noticeable, although I have not seen a specimen in which they are absolutely wanting. This recently differentiated form was apparently included under *canteneraria* in STAUDINGER's Catalog. — The egg is oval, the surface covered with irregular polygonal depressions, the micropylar rosette with about 8 cells; grey-yellowish, changing in a few days to red. The larva is slender, tapering anteriorly, the head small, the body somewhat flattened dorsally, carinated laterally, the skin transversely folded; very variable in colour, pale or dark grey or almost blackish, or light brown, the lateral ridge whitish ochreous, usually accompanied beneath by a blackish band; dorsal line pale ochreous, grey-edged on the last few segments and usually on the thorax, sometimes also at the beginning of each segment; in some forms a distinct diamond-shaped dorsal pattern is present, or at least the posterior half of it on each middle segment (V-shaped markings). Polyphagous, thriving well on withered leaves of dandelion etc. Pupa light brown, coarsely black-spotted dorsally, and more finely on the rest of its surface; the dorsal spots arranged in four rows. The moth is generally abundant, in a succession of broods, first appearing in May, or earlier in southern localities; it does not appear to show any appreciable seasonal dimorphism, unless it be in size. It is conspicuous by day sitting on the leaves of various plants or on fences or walls; on white walls it has been *reputed* to seek out grey patches which harmonize with its colour (PIEPERS, "Mimicry", p. 199). Flies gently at dusk, seldom at a great height from the ground. Europe, excepting a few western and extreme northern localities, and also in N. Africa; not known from Asia. *minuscularia.*

Pt. sartharia *Stgr.* (3g) strongly resembles a weakly marked, dirty grey form of *seriata*, but is easily distinguished by the simply and shortly ciliated ♂ antenna. According to STAUDINGER the structure of the ♂ hindleg "appears to be quite as in *virgularia*" (*seriata*); of the only ♂ before me one hindleg is lost and the other is in a position which prevents exact investigation, but it seems to me that the tarsus is more strongly abbreviated; the tibia is certainly strongly tufted. Some specimens are altogether without markings, excepting the black discal dots; in others there is a very weak postmedian line, chiefly expressed by dark teeth on the veins, sometimes also (at least in the ♀) traces of inner line and median shade. Under surface similarly without or with only very weak markings, the hindwing paler than the forewing. Ferghana. — ab. (?) *sarthularia* *Stgr.* from Northern Ferghana is much more strongly marked, the groundcolour lighter; an obsolete median shade passes on the hindwing far proximally to the discal mark, which here forms a large lunule; the forewing lacks this median shade, but shows the weak postmedian line and beyond it a distinct, narrow dark band. The fringe shows thick black dots or dashes at its base; in typical *sartharia* these are weak or wanting. Only a single example (♂) is yet known. *sarthularia.*

Pt. conioptera *Hmps.* (7d) may best be compared with *sartharia*, but has the distal margin of the hindwing rather more strongly excised, nearly as in *incisaria*. The coloration is appreciably darker, the wings being more densely dusted with fuscous atoms. Discal dot on both wings rather large and distinct. Postmedian line usually distinct, strongly dentate, in particular with a large acute tooth on the first radial of the hindwing; on both wings this line is placed somewhat nearer to the discal dot than in *sartharia*. Some of the other lines are as a rule faintly traceable; in the only known ♀ (which, more than in *sartharia*, is narrower-winged than the ♂) two lines proximally to the postmedian are fairly well expressed on the inner-marginal half of the hindwing. Dark spots on fringe somewhat sharper than in *sartharia*. Under surface similarly but still more weakly marked; hindwing slightly paler than forewing. ♂ antennal ciliation as in *sartharia*; hindleg short and weak, tibia with hair-pencil, tarsus nearly one-half the length of tibia. Kujiar, Himalayas, at nearly 2000 m elevation, 5 ♂♂, 1 ♀ in the British Museum collection, all taken in April 1889. *conioptera.*

Pt. descitaria *Chr.* (= *velitschkovskyi* *Rbl.*) (3h) is very manifestly another relative of *seriata*. It was quite erroneously sunk by STAUDINGER to *elongaria pecharia*, which it resembles in colour. Brownish grey, very densely irrorated with dark scales; the lines and median shade present, sometimes stronger, sometimes weaker. Forewing with antemedian strongly excurved, slightly dentate on the veins; cell-dot black, often large; median shade rather thick, closely following the cell-dot; postmedian dentate, rather markedly bent outwards at the 3. radial and 1. median; subterminal line ill-defined, slender, often appearing somewhat interrupted; fringe with a slender pale line at extreme base, then a slender dark line on which stand rather thick, more or less elongate black dots opposite the veins. Hindwing with distal margin very weakly emarginate between the radials, scarcely more so than in *seriata*; median shade angled on the median vein, its anterior half sometimes strongly curved round the cell-dot; cell-dot usually rather large; postmedian line, except in rare aberrations, closely following the cell-dot, often appearing as a continuation of the median of the forewing, very rarely placed so far distally as the postmedian of the forewing; fringe as on forewing. Underside of forewing similar, *descitaria.*

without first line; of hindwing somewhat lighter, the median shade (when developed) crossing the cell-dot, the postmedian placed nearer the distal margin than on the upper surface. ♂ antennal joints scarcely at all projecting, ciliation even, quite moderate; hindtibia shortened and thickened, with strong hair-tuft, tarsus extremely short. Larva similar to that of *seriata*, moderately elongate, tapering anteriorly, somewhat carinated laterally, skin transversely folded; head small; dorsal area reddish brown, indistinctly marked, at least in the single preserved larva before me; an ill-defined slender double grey dorsal line, becoming darker and better defined posteriorly; faint indications, especially on the 3.—5. abdominals, of oblique grey lines divaricating from the posterior margin of the segment; lateral ridge pale, followed below by a dark band; ventral area again reddish brown, paler in the middle, with indications of lozenge-shaped pattern; spiracles not very conspicuous. Pupa light brown, similar to that of *seriata*, but with the wing-veins strongly darkened. In captivity Herr PÜNGELER has obtained three generations in the year, the moths showing no appreciable seasonal dimorphism. Only hitherto known from S. Russia, S. W. Siberia and according to CHRISTOPH Kuldja. Differs from *conioptera* in the less emarginate hindwing, the more brownish grey colour and usually in the closer approximation of the postmedian line of the hindwing to the discal dot.

longaria.

Pt. longaria H.-Sch. (= *prolongata* Rbr.) (4 d) differs essentially from *seriata* in the long, narrow wings; in the ♀ the form is even more extreme than in the ♂, and the ground-colour is usually whiter, indeed often quite white. The lines (usually broken into rows of dots) and the slender median shade are acutely angled near the costal margin and then run parallel with the very oblique distal margin; on the hindwing they are generally not traceable as far as the costal margin; on both wings the postmedian is commonly followed by a narrow, vague, brownish band. Both wings with black cell-dot and black dots at base of fringe. The distal margin of the hindwing is sinuous, showing an appreciable but not deep concavity between the radials. Under surface more weakly marked, forewing somewhat suffused towards base; discal dots well expressed, sometimes also the median of forewing and postmedian of both wings. Spain and Portugal, Sicily, North Africa, Teneriffe, double brooded. The egg is spheroidal, with longitudinal sulci and each sulcus with polygonal depressions; whitish yellow at first, later intersected with ochreous reddish. Larva moderately slender, attenuated anteriorly, lateral ridge undulate, the black-edged spiracles placed in the lower part of each curve; head dirty white, body variable in colour, pale reddish, greenish or blackish grey, always darker speckled, ventrally more uniform; first two abdominal segments paler; last three with a broad dark dorsal line; tubercles black. Like most of the genus, it prefers dry leaves to fresh. Pupa yellowish, spotted with black, anal extremity brownish, wings green with black dots and lines.

atlantica.

Pt. atlantica Sttn. (5 b) seems to me to be scarcely more than a dwarfed local form of the preceding, but as the excisions in the distal margin of the hindwing are rather deeper and the teeth at the first radial and the anal angle stronger, and as moreover I have been unable to examine the ♂ structure in *longaria*, I leave it provisionally separate. Only the three original specimens are before me, the ♂ (type) in good condition but without abdomen, the two ♀♀ slightly worn. As in *longaria*, the ♂ is greyer, the ♀ whiter; in both sexes the area between the median and postmedian lines is almost entirely free from dark dusting, thus forming in the ♀ a clear white band, which is not manifest in my few examples of *longaria*. Otherwise I find no material differences in the markings, unless it be that in the ♂ (and to some extent in one ♀) the lines and median shade of the forewing arise from thicker dark costal marks; I have not seen any *longaria* in which the median line, in particular, is so strongly expressed on the costa. Forewing beneath somewhat more suffused. ♂ antenna with the joints somewhat projecting, ciliation moderate; hindleg short, tarsus strongly abbreviated (about. 5 mm.). Only known from Madeira.

sublongaria.

Pt. sublongaria Stgr. (3 g) is nearly related to *longaria* but larger and much darker, more brownish, the lines better expressed, not broken up into dots, the pale subterminal well developed; postmedian line fine, slightly denticulate, the teeth somewhat blacker-marked on the veins; discal dots weak, especially on the under surface. The markings of the upper surface, except the first line of the forewing, are reproduced beneath, though rather less distinct. ♂ antenna with fascicles of long cilia; according to STAUDINGER the ciliation is longer than in *longaria*. Palestine and Syria, in April.

allongata.

Pt. allongata Stgr. (3 g, ♂) is also closely related to *longaria*. The ♂ is rather dark, the ♀ light grey-brownish, intermediate between *longaria* and *sublongaria*. The lines on the forewing are well developed, especially in the ♀, and are all acutely angled near the costal margin; the black discal dots and a series of large dots at the base of the fringes also well developed. The median line is placed somewhat differently from that of the allies, being nearer to the postmedian; on the hindwing it crosses the large black cell-dot or follows it, while in the other species it is proximal thereto. ♂ antenna with fascicles of long cilia. Mardin, N. Mesopotamia, also from Jerusalem and the Jordan Valley in coll. PÜNGELER.

Pt. gracilipennis Warr. Described from a single ♂ from Beyrout, in very bad condition. It will perhaps be identifiable by the structure, but hitherto I have not seen any other Palearctic examples which I can refer to it; it more recalls two or three South African species, such as *minimaria* Warr. and *umbricosta* Prout. Antenna evenly ciliated, the cilia little longer than the diameter of the shaft. Hindleg rather small, but with the tibia well thickened; tarsus extremely abbreviated, about one-fourth or one-fifth the length of the tibia. Wing-expanse about as in an average *humiliata* (19 mm, English system of measuring); wings very narrow, glossy, bone-colour, the markings entirely lost, the costal margin of forewing more reddish. Forewing beneath more mixed with reddish; costal margin of hindwing beneath also somewhat reddish. Face reddish brown.

Pt. pallidata Schiff. (= *byssinata* Tr.) (4 d, ♂). Noteworthy for the usually strong sexual dimorphism in the coloration, which misled TREITSCHKE into describing the ♀ as a separate species, under the name of *byssinata*. ♂ pale whitish-ochreous with broad darker wavy, parallel lines or bands, between which the ground-colour appears as pale, in part narrower lines. Forewing more or less suffused with ochreous basally; no cell-spot on either wing, nor dark distal-marginal markings. Fringe concolorous. Underside dull ochreous with some blackish dusting, especially on forewing; a dark discal dot and postmedian line present, also the pale subterminal. ♀ somewhat smaller, white, with the ochreous lines fine and sometimes faint; the under surface, also white, shows corresponding markings to those of the ♂, though rather weak. ♂ antenna with longish fascicles of cilia; hindleg short and weak, the tarsus very short. Egg rather a short oval, with depression on the upper side; yellowish green, the surface dull, the pattern consisting of rather irregular hexagonal pitting. Larva not very elongate, tapering anteriorly, rather flattened, laterally sharply carinated, skin transversely folded, segmentation well marked; grey-brown with fine double black dorsal line, strongest on the last 3 segments; subdorsal indistinct except on thorax and last few abdominal segments; 5 V-shaped dorsal marks, their points directed posteriorly; lateral ridge lighter, with black spiracles; ventral area mostly blackish, lighter in middle. Pupa yellow-brown with black incisions and dorsal line and black wing-veins. Imago in May and June. Distributed in Central and parts of North Europe, Central Asia and Siberia; wanting in a great part of Western Europe.

Pt. argilata Guen., described from a single ♀ from Lozère, is according to STAUDINGER a good species, and it is remarkable that it has never been rediscovered. GUENÉE describes it as near *holosericata* (*dilutaria* Hbn.) but larger, with much of the aspect also of *deversaria*, with which it agrees in size and nearly in shape; distinguished from both by its very uniform pale greyish-ochreous tone, which is tinged with greenish. The lines are all uniform, slightly waved and parallel, occupying the entire surface as in *holosericata*; they are rather shades than lines, and only very slightly darker than the ground-colour. Both wings with a small but distinct discal dot. Under surface still more weakly marked. According to BELLIER the forewing is more acute than in *pallidata*, the lines thicker and straighter, less distinct, the palpus ochraceous, not brown; but he only possessed one example of *pallidata* for comparison.

Pt. nudaria Chr. (3 h). Uniform dull ochreous, glossy, with very faintly darker median and postmedian lines, on forewing rather straight, on the hindwing (at least in the specimen before me) the postmedian incurved between the radials; forewing also with traces of an antemedian line. Under surface paler, especially of hindwing, the median and postmedian lines rather better expressed, the costal margin of the forewing a little more deeply coloured than the rest. ♂ antenna rather stout, ciliation of medium length; hindtibia short, strongly thickened, tarsus quite short. CHRISTOPH, who indicates the presence of "two strong spurs", evidently mistook the middle for the hindleg. Differs somewhat from *pallidata* in shape, in the fuller ochreous tone, still weaker lines, lack of subterminal, the shorter antennal ciliation, etc. Amurland and Ussuri, originally discovered in the Chingan Mountains in July. — **infuscaria** Leech (3 h) from Japan and China is a darker, rather better-marked form in which a somewhat pale subterminal line is indicated. Occurs in June and July. The ♀ is lighter and more ochreous than the ♂, but *infuscaria* is decidedly variable, and although the differences here indicated are applicable to all, it is quite possible that more extensive Siberian material will produce examples corresponding to it.

Pt. obfuscaria Leech is another glossy-winged species, but is of a darker, more blackish brown colour and even more weakly marked, the lines being indeed scarcely discernible. The fringes are rather lighter. The anal extremity and ventral surface of the abdomen are somewhat less dark, also the legs. The structure agrees with that of the preceding, and as the only two specimens yet known were taken at the same time and place as *nudaria infuscaria* it seems to me very probable that it may prove to be merely a very extreme aberration. Ningpo, 2 ♂♂, June and July.

uniformis.

Pt. uniformis Stgr. (3 h). Both wings above and beneath uniform pale yellowish sand-colour. The transverse lines (antemedian, postmedian and sometimes also a median) discernible in certain lights but excessively weak, only sometimes (except the median) slightly better indicated on the costal margin of the forewing, by slightly enlarged spots; on the underside entirely wanting. Discal dot sometimes present on forewing above, though not very darkly coloured; its position (much beyond the middle of the wing) draws attention to one of the chief peculiarities of the species, the elongate cells of both wings. Otherwise it presents few striking characters. In shape it is not greatly different from the two preceding species. The ♂ antennal ciliation is moderately long; the hindleg short and weak, tarsus much abbreviated; tongue apparently wanting or rudimentary. The only ♀ which I have seen is very much larger than the figured ♂, but this seems to be unusual; STAUDINGER gives 19 mm for a ♂, 17 mm for 2 ♀♀. Palestine: Jordan Valley, end of May.

squalidaria.

Pt. squalidaria Stgr. (3 h) is another rather inconspicuous species, with glossy, very weakly-marked wings. It may best be compared with *subsericeata*, from which, however, it is easily distinguished by the straight distal margin of the forewing, which causes the wing to appear more pointed (rather recalling the shape of *ossiculata*) and by the more yellowish (or even brownish) white ground-colour. The ♂ antenna is similar, though the ciliation appears slightly shorter in *squalidaria*; the hindtibia is less thickened, the tarsus about equally short. Lines very weak in the ♂, somewhat better expressed in the ♀, wavy or subdentate; cell-dots, marginal dots and the first line of forewing obsolete. The forewing beneath is slightly more tinged with brownish or smoky, the hindwing more white; the lines of the upper surface sometimes present, sometimes absent, the ♀ being here also the better marked. According to STAUDINGER the ♀ sometimes shows 3 very minute marginal dots. Originally described from Panticosa (2200 m) on the Spanish side of the Pyrenees, but Dr. CHAPMAN has more recently discovered it at Gavarnie. Flies in July.

subsericeata.

Pt. subsericeata Haw. (= *perfluaria* Bdv. = *pinguedinata* Zell. = *oloraria* Rössl.) (4 d). White with strong silky gloss, the lines grey, seldom strongly expressed, on the other hand usually all present, thus numbering 5 on the forewing and 4 on the hindwing; the outermost line (distal shading of subterminal) the oftenest absent; all except the median are parallel with the distal margin, but slightly wavy; the median on the forewing is usually somewhat oblique, but occasionally almost parallel with the others; that of the hindwing runs straighter across the wing, instead of following the curve of the strongly convex distal margin. Cell-spots and terminal line wanting or rarely the former present, minute; fringe usually with a series of minute black dots at the base, which are sometimes in part, more rarely entirely obsolete. Forewing beneath often with a smoky suffusion, either basally or all over; median and postmedian lines present, often well developed; a small discal dot present. Hindwing beneath white, with discal dot and postmedian line. ♂ antennal ciliation little longer than diameter of shaft; hindtarsus short. Not on the whole an extremely variable species, except in size; there is, however, a great deal of trivial variation, i. e. as regards the absolute or relative strength of the several lines, the close proximity of the inner subterminal to the postmedian or their wider separation, the degree of suffusion of the under surface, etc. Second-brood specimens, besides being smaller,

obscura. seem to be on an average whiter beneath and are sometimes rounder-winged. — ab. **obscura** Rbl. is the only really striking aberrant on which I am acquainted. The entire upper surface is uniformly suffused with dark grey, only the fringes remaining white. The grey lines are entirely obliterated, but the subterminal is

mancuniata. faintly discernible. Founded on a single example from N. Cornwall. — **mancuniata** Knaggs (= *veterata* Gregs.), from N. England (Lancashire and S. Yorkshire), which was considered (chiefly on some larval differences) a separate species, scarcely seems to be even a constant local race; it was founded on bred specimens, of a somewhat more ochreous tone, with the minute marginal dots rather even, the forewing less pointed,

asbestaria. thus in part corresponding to the second brood. — **asbestaria** Zell. is merely diagnosed by STAUDINGER as a "larger form". ZELLER, who erected it as a separate species (from *pinguedinata*), adds that the wings are a little broader, the forewing a little whiter, the dots on the fringe weaker, the palpus not brown at the tip. It was described from Tuscany. In the type specimens I can see but little difference from the other forms and it

diaphanaria. must be borne in mind that ZELLER's *pinguedinata* (♂ Messina, ♀ Cisterna) was somewhat dwarfed. — **diaphanaria** Bang-Haas, also erected as a species, appears, according to a cotype in the PÜNGELER collection, to be a rather large, rather clear white, weakly marked form (local race?) of *subsericeata*, the median and postmedian lines rather widely separated, especially on the hindwing. Its structure agrees entirely, and very similar forms occur in Turkey, Algeria and probably elsewhere. *diaphanaria* was described from Ain Draham, Tunis. — Egg oval, laid flat, the upper side with a long central depression; the entire surface with regular, minute pitting; colour very pale yellowish, changing to pale orange with red blotches. Larva slender, tapering considerably towards the head, skin rugose, strongly granulated; dull whitish grey, dorsal surface reddish, mediodorsal line black but very slender and inconspicuous, subdorsal also black, more distinct at anterior and posterior extremities, lateral line dull yellowish white, a dull yellow spot on the side of the sixth abdominal segment, ventral surface whitish in the middle, with black spots. The pupa is darker brown than that of any other *Ptychopoda* with which I am acquainted, indeed almost blackish, and with the wing-veins unusually

strongly marked; the wing-cases are in the living pupa more greenish; the posterior part of the abdomen darker than the anterior; the cremaster is furnished with the usual 6 fine, hooked-tipped bristles, not with "two" only, as indicated by BARRETT. Varying accounts have been given of the larvae, and to some extent of the pupae, of the forms *mancuniata* and *asbestaria*, but it was already long ago noticed by RÖSSLER that this species is very variable in the larval stage, and it is not surprising if the variation is in part local. The moth appears in June and there is often a second brood in August. In captivity a third generation is not rarely obtainable in the late autumn, though of very small size, with rounded wings. MELDOLA has recorded observing a specimen flying among *Asthenes albulata* Hufn. (*candidata* Schiff.) and suspected a case of mimicry. *subsericeata* is attracted by a strong light and occasionally visits "sugar". Central and South Europe, North Africa, Asia Minor to Transcaspia.

Pt. sylvestraria Hbn. (= *straminata* Tr. = *marginipunctata* Steph.) (4 d, as *straminata*). Very *sylvestraria*. distinct from *subsericeata* in the much less white ground-colour, which is pale greyish ochreous with scattered black speckles, the much more conspicuous black dots at the base of the fringes, much more sinuous postmedian line and other characters. Both wings have a conspicuous though small black discal dot. The postmedian line is often rather well-developed, marked with darker dots on the veins, on the hindwing it is not only sinuate inwards between the radials and again posteriorly, but is also more or less strongly angled on the first radial; the two lines or shades which edge the subterminal are usually (especially the distal) very ill developed or wanting. On the hindwing the median shade crosses or follows the discal dot. On the under surface the forewing is a little darker, the hindwing a little whiter, the postmedian line and usually the median more strongly developed than above. ♂ antenna about as in *subsericeata*; hindtarsus slightly longer — about half as long as tibia. — ab. **graciliata** Mann is a weakly-marked aberration, described from Bozen as a separate species; only the costa of the forewing distinctly dusted, median and postmedian reduced to dots on the veins. — **circellata** Guen. (= *obsoletaria* Westw. nec Rbr. = *folognaria* Stgr.), likewise described as a separate species (indeed not even compared with *sylvestraria*!) is an interesting form on account of its tendency to constitute a local race in some places. Thus on the "mosses" of Lancashire and Cheshire it was formerly of regular occurrence, and the older British lepidopterists maintained its specific right with remarkable persistence, notwithstanding the occurrence of intermediate forms both there and elsewhere. Other localities where it tends to form a race are Belgium and S. W. France. It is in general of a slightly more smoky or olivaceous tone, the antemedian and postmedian lines of the forewing and the postmedian as well as often the median of the hindwing very strongly expressed; the dots on the postmedian are usually very prominent, giving to this line a denticulate appearance. Sometimes the median line and the two subterminals are also moderately well developed. — The larva of *sylvestraria* is rather slender, tapering anteriorly, the head small and notched, the skin rugose and transversely folded; grey, with a fine pale dorsal line, bordered on the middle of the central segments with distinct black streaks, otherwise only indistinctly dark-edged, subdorsal line very indistinct; lateral line whitish or obsolescent. Pupa reddish brown, abdomen darker-ringed cremaster black-brown; wings tinged with green, the veins conspicuous. The moth inhabits damp places on heaths or moors, resting by day among heather and apparently less readily disturbed than many of the species. It flies in June and July and is local in Northern and Central Europe, S. France, N. Spain, Dalmatia and Transcaspia. I have not seen Asiatic examples.

Pt. mancipiata Stgr. I have not seen the typical form, which was diagnosed as follows: "Form of and similar to *straminata* (*sylvestraria*), ♂ antenna with much longer ciliation, hindleg short, compressed, without spurs. Wings yellowish grey, with black central dot, darkened posteriorly, forewing with 3^d darker lines (the 1. obsolete, 2. broader, 3. distinct, dentate), hindwing with 2 (the 1. broad, proximal to the central dot, the outer dentate)". Granada, end of June to September. Since recorded also from Castile, Sarepta and S. Ferghana. — **repagulata** form. nov. (7 d). In the ZELLER collection stand 1 ♂, 2 ♀♀ from Sarepta, under the MS. name of *repagulata* Chr., which I have no hesitation in determining as a local form of *mancipiata*. They agree fully with the diagnosis but are as white and at least as strongly silky as *subsericeata*, the distal area little darkened. Discal dots very conspicuous. ♂ antenna with fascicles of cilia; hindtibia scarcely longer than femur, rather weak, but with hair-pencil, tarsus greatly abbreviated.

Pt. tristriata Stgr. For a knowledge of this species and the following I am dependent solely on STAUDINGER's published descriptions. Forewing dirty clay-yellow with fine dark dusting and 3 (or 4) dark lines, hindwing dirty white-grey with 2 dark lines. Both wings with a dark central lunule, but crossed on the forewing by the second, on the hindwing by the first line and thus almost obliterated. In one specimen, where this line (really the median shade) is lighter, the spot is more distinct. Base of fringe (in forewing only) with dark dots. Underside dirty grey-yellow, the lunules weak, the median and postmedian lines more or less developed; hindwing whiter than forewing, its distal half more strongly dark dusted than the proximal. Face dirty chestnut-

colour, vertex pale whitish grey. ♂ antennal ciliation somewhat shorter than in *seriata*; hindleg moderately long and thin, more so than in the *seriata*-group. A very distinct species, which might perhaps be placed near *pallidata*. Margelan, S. Ferghana, described from 2 ♂♂.

detritaria.

Pt. detritaria Stgr. ♂ antenna with the ciliation short, though apparently somewhat longer than in *laevigata*; hindleg aborted. Hindwing not so regularly rounded as in *laevigata*, more flattened or subconcave between the radials and posteriorly, thus a little prominent in the middle. Ground-colour about as in *biselata*, *degeneraria*, etc., moderately thickly sprinkled with dark scales. Forewing with 3 curved blackish-brown transverse lines, hindwing with 2, the median on both wings the thickest. Terminal line dark, sharply expressed. Fringes indistinctly chequered. Under side somewhat lighter, still more strongly dusted with brown; first line of forewing wanting, a small dark cell-mark close before or on the median shade. Described from 6 examples from Haifa, Syria. In the figure the entire basal half of the forewing is represented as somewhat infuscated.

laevigata.

Pt. laevigata Scop. (= *renularia* Hbn. = ? *bellata* Frr. = *lividellaria* Peyer) (4 d). Recognizable at once — unless possibly in a few very weakly marked specimens of the second generation — by the dark band on the posterior margin of the forewing which immediately follows the first line and extends about to the median vein, becoming very faint and shadowy or almost entirely obsolete anteriorly. Wings rather glossy reddish grey; forewing with first line distinct, especially on the veins, bent in the cell, postmedian strong at the costal and posterior margins, slender and sometimes weaker between, but accentuated on the veins; hindwing with a thick dark line or shade continuing the dark band of the forewing, a discal dot just beyond this, and again very shortly beyond the discal dot a slender postmedian line; fringes with large blackish dots opposite the veins. Under surface very weakly marked, forewing usually with a distinct costal spot, indicating the commencement of postmedian line, and a moderately distinct cell-spot; hindwing a little more whitish, with distinct cell-spot. ♂ antennal joints thickened, the ciliation very short; hindtarsus short. Except that the second-brood specimens are smaller, with the median band narrower and less developed, I have noticed little variation in the species. The larva is thick, strongly attenuated anteriorly, rugose, carinated laterally; general tone a vague glaucous greenish, with fine interrupted dorsal line and lozenge-shaped pattern marked in brown or blackish; subdorsal obsolete; lateral ridge pale, bounded by a darker stripe. According to MILLIÈRE's figures and a description by RÖSSLER the most distinct part of the dorsal pattern is usually a pair of blackish dashes anteriorly on each segment. Pupa rather slender, shining greenish yellow. Imago in June and July and again in September. Local in Southern and Central Europe, Syria, Transcaucasia and N. Persia.

extarsaria.

Pt. extarsaria H.-Sch. (= *efflorata* Zell.) (4d as *eripodata*). Rather longer-winged than *laevigata*, slightly less glossy and of a more ochreous tone; a conspicuous dark distal-marginal line, interrupted only at the vein-ends; the band which follows the first line entirely wanting; fringes without black spots, though intersected by an indistinct dark line. The cell-dot is present on both wings, though stronger on the hindwing. The hindwing is somewhat dark-suffused basally. Underside more weakly marked, forewing more or less suffused, both wings with cell-dot and postmedian line, the latter less distinct than above. ♂ antennal ciliation very short; hindtibia with long hair-pencil, tarsus broadened and flattened, somewhat spatulate. The type form inhabits Central Italy and transitional forms are recorded from Sicily. — ***eripodata*** Grasl. (= *inesata* Mill. = *atromarginata* Mab.) (4d as *extarsaria*) seems the more widely distributed form, often replacing the type but sometimes occurring with it as an aberration. It differs in having the distal area of both wings almost entirely filled up with reddish- or violet-grey, only a small apical patch usually remaining of the ground-colour. The basal area of both wings is also more or less suffused. The names of this and the type-form are by oversight reversed on our plate. S. France, Corsica, Sicily, N. E. Spain, N. Africa. — Both the type-form and *eripodata* are double-brooded, the specimens of the second brood smaller and sometimes paler.

disjunctaria.

Pt. disjunctaria Stgr., founded on a single ♂ from Catalonia and apparently remaining unique, may possibly, according to its author, be an aberration of the preceding; but as the original account describes the hindleg as "fully developed" and does not mention the peculiar tarsal formation the union seems precarious. Dirty yellowish, broadly suffused with violet (reddish) distally. Forewing with basal line only represented by dark spots on the margins; postmedian line, before the darker border, very indistinct, arising from a large dark spot or dash on the costal margin; pale subterminal indistinct, undulate or subdentate. Hindwing with these markings still weaker. A series of very large dark elongate spots at the base of the fringe, extending round the apex on to the distal end of the costal margin. Underside uniform shining grey, the fringe-spots much less distinct, but both wings with a small faint cell-dot and a fine dark terminal line.

Pt. benestrigata *sp. nov.* (7d). Palpus quite short. Tongue long. Antennal joints not projecting. Face *benestrigata*. white, tinged with sand-colour; vertex purer white; collar and front of thorax bright sand-colour. Abdomen robust. Wings rather long and narrow, shaped somewhat as in *infirmaria* (4c), but with costa of forewing still straighter, distal margin more curved, that of hindwing rather more produced to the 3. radial but not at all emarginate between the radials. White, slightly dusted with sand-colour, not glossy; lines bright sand-colour. Forewing with antemedian line very thick, strongly outcurved anteriorly and angled outwards on 2. submedian; median line less thick, weakly sinuous, closely followed by thicker postmedian; subterminal shades less strong, somewhat interrupted; no cell-spots; distal margin with a series of conspicuous black dots between the veins; fringe white proximally, sandy distally. Hindwing without the first line. Underside mostly whitish, forewing with the costal edge sandy and a slight sandy tinge in the apical region; both wings with an incomplete, dull sandy band occupying the position of the proximal subterminal line. Afghanistan, without more exact locality; collected by Colonel ALEXANDER FORTESCUE and presented to the British Museum by Lord WALSHINGHAM. A very distinct species, but in the absence of the ♂ the subgeneric position cannot be ascertained.

Pt. infirmaria *Rbr.* (= *nigrobarbata* *Stgr.* = *carnearia* *Mann* = *ledererata* *Guen.*) (4e). Vertex *infirmaria*. of head and base of antenna white. Wings rather narrow, pale grey with a more or less strong admixture of dark grey and red scales, costal edge of forewing usually very narrowly infuscated to beyond middle; the antemedian and postmedian lines usually and the median line (or shade) at times fairly well developed; antemedian line of forewing thickest at costal margin, rather strongly bent or angled subcostally, postmedian line more slightly curved subcostally, both marked with dark dots on the veins; both wings with black cell-dot, that of the hindwing the larger; median shade of hindwing placed well proximally to the cell-dot, usually appearing as a continuation of the first line of the forewing; fringes with dark spots opposite the veins. Under surface pale grey, coarsely dark-dusted; no red admixture; lines present or obsolete; cell-dots present, usually strong. Variable, but easily recognized by its shape and the mixture of grey and red scaling. ♂ antenna rather thick, with the ciliation extremely short; hindleg short, the tarsus very greatly abbreviated. — *aquitania* *Const.* is darker and at the same time with a stronger admixture of red scales. It is said to form a local race in S. W. France (province of Landes) but in most localities it occurs merely as an aberration; in any case it is not a particularly striking form. — I have no information regarding the early stages of this species; REBEL in his recent edition of the "Schmetterlingsbuch" says that they are still unknown. It inhabits Corsica, Sardinia, Sicily, S. E. France, the Iberian peninsula, N. Africa and Dalmatia. When STAUDINGER published the last edition of his Catalog, Andalusia was the only certainly known Iberian habitat, but Leon (Branuelas) and Portugal have since been added. Flies in June—July.

Pt. rhodogrammaria *Püng., sp. nov.* (3h). "Expanse 15—18 mm. Near *infirmaria*, smaller, antenna *rhodogrammaria*. with somewhat stronger shaft and longer ciliation, hindtarsus fully $\frac{1}{3}$ the length of the tibia. Ground-colour yellowish, forewing with 5, hindwing with 4 rose-red lines, costal margin of forewing rose-red, finely edged with blackish, dots in fringe and the discal dots sharp, black, underside similar to that of *infirmaria* but lighter, the hindwing in particular whitish. S. Spain, Murcia, Sierra d'España, 3 ♂♂, M. Korb, beginning of July 1909 at light".

Pt. obsoletaria *Rbr.* (= *rufillaria* *H.-Sch.* = *rufularia* *H.-Sch.*) (4e). A rather obscurely marked *obsoletaria*. species of small size and moderately variable in colour, glossy greyish or light ochreous or even bright reddish ochreous. Often smaller than the specimen figured, but remaining larger and broader-winged than *helianthemata* *Mill.* with which perhaps it could most easily be confused. Vertex of head pure white (in *helianthemata* more tinged with ochreous); distal margin of hindwing rounded. The less elongate wings also distinguish it from *infirmaria*. A few writers have seen a resemblance also to *Acidalia ochroleucata* *H.-Sch.*; to me this does not seem very obvious, but in any case the different neuration and other differences of structure will separate it. Lines wavy, only a little darker than the ground-colour, all generally about equally distinct (or rather, indistinct). Cell-dot on both wings minute but quite black, hence conspicuous. Fringes with minute, but nearly always conspicuous black dots at base opposite the veins; in rare aberrations where these are obsolescent there is considerable resemblance to *incarnaria*, but really pink forms of *obsoletaria* seem to be unknown, nor is the costal margin of the forewing differentiated in colour from the rest of the wing. Under surface rather paler, equally weakly marked. ♂ antennal ciliation rather short; hindleg short and weak, the tarsus greatly abbreviated. The colour-aberrations intergrade and do not require separate designation. — Only ab. *violacearia* *Stgr.* has been founded on colour differences, and this deserves mention chiefly because its author suspects that it has developed into a local race in some places, at least on the Island of Majorca. The ground-colour is described as violaceous grey. I have not seen examples having this coloration. It is recorded also from Catalonia and Greece. — Concerning the early stages I can find but little information. HOFMANN, misled by MILLÈRE'S

earlier confusion of this species with one form of *helianthemata*, has referred his account of the latter to *obsoletaria*. According to REBEL the larva is short, strongly folded transversely, greenish brown, variable, often only with a subdorsal broken up into black dots, sometimes with light, pearshaped dorsal spots, the lateral ridge spotted with black; head very small, black-brown, deeply bifid; very sluggish, living in June on low plants. Even this account may possibly be adapted from one of *helianthemata*; its source is not indicated. Single brooded, the moth appearing in July and August. Widely distributed through Southern Europe and eastward to Transcaspia and Persia. A local race, unknown to me, is said to occur in Northern Ferghana.

algeriensis.

Pt. algeriensis Baker (5 b) has been treated as a local race or aberration of the preceding, which it certainly resembles very closely; but I do not think they can be conspecific. Unfortunately the type specimen (♂), which alone is known to me, has lost its hindlegs and one antenna, while the cilia of the other antenna are slightly damaged; otherwise the specimen is in very beautiful condition. *algeriensis* would be nearest to the greyer forms or — since it shows in certain lights slight violaceous reflection) to the form *violacearia*, but it is even more strongly glossy and the vertex of head and base of antennal shaft are not white but concolorous with the body and wings. The discal dots are unusually large — fully as large as in the most extreme specimen of *obsoletaria* which I have ever seen; the black dots in the fringe moderately well developed (not “subnullis”, as in STAUDINGER’s diagnosis). The lines of the upper surface are weakly expressed, very slender (in *obsoletaria* they are in general comparatively thick); on the under surface they are more prominent than is usual in *obsoletaria*, the postmedian of both wings in particular well developed. The antennal ciliation, so far as can be made out, appears even shorter than in *obsoletaria*. Sebdu, Algeria.

troglydytaria.

 **Pt. troglydytaria** H.-Sch. has been doubtfully referred by STAUDINGER as a variety or aberration to *obsoletaria*, with the following localities assigned to it: Crete, Greece, the west of Asia Minor, Syria and perhaps the southern Ussuri district. Herr PÜNGELER, however, writes me that he possesses a very small Acidaliid from Syria which perhaps represents this species of HERRICH-SCHÄFFER’s but is certainly distinct from *obsoletaria*. It is therefore desirable that for the present *troglydytaria* should be kept separate, and I here give HERRICH-SCHÄFFER’s brief characterization of it in full. “Probably the smallest Geometrid, habitus of *aversata*, silver grey inclining to bone-colour, glossy with scarcely a trace of the usual transverse lines and subterminal, but with distinct central dots and dots in the fringes at the ends of the veins. Face brown; hindtibia with only the terminal spurs. One ♀ from Crete”. STAUDINGER says that the original is even smaller than the figure which HERRICH-SCHÄFFER gives of it and its colour not quite so white. The only extremely minute *Ptychopoda* known to me from Syria is *elongaria* ab. *monadaria* Guen. which is often quite as weakly marked, but would presumably differ in being whiter and less glossy, perhaps more strongly dark-dusted.

incarnaria.

Pt. incarnaria H.-Sch. (4 e) differs from *obsoletaria* in its coloration and usually in its more weakly expressed lines, but with a marginal line present, at least beneath. Often larger than that species, forewing rather more elongate. In the type-form the wings are fleshpink or reddish, the costal margin of the forewing very pale yellowish; the front of the thorax is also pale, but the collar is darkened, reddish; vertex of head somewhat less pure white than in *obsoletaria*. Both wings with a blackish discal dot. Fringe concolorous with wing, only minutely dotted with black. Under surface rather paler, especially of hindwing. The ♀ is generally larger and darker than the ♂. — ab. **ruficostata** Zell. (= *grisea* Th.-Mieg) differs in having the ground-colour violaceous grey and the costal margin reddish instead of yellowish. It is recorded from Central Italy, Greece, Syria, the Taurus and N. E. Africa, perhaps the prevailing form in the two last-named localities. I follow STAUDINGER in sinking the name of *grisea*; THIERRY-MIEG merely says that it is pearl-grey instead of red,

ruficostata.

distinctaria.

and does not mention the costal margin. His locality was the Eastern Pyrenees (two examples). — ab. **distinctaria** (Bdv.) Guen. is described as greyish white, glossy, with a slight violet or pearly tinge, the distal lines indicated, the cell-spots grey, very small, and some indistinct terminal dots. Costa of forewing narrowly ochreous beneath. Has been regarded as a weakly-marked form of *obsoletaria*, but according to HOMBERG (i. l.) the type specimen belongs to *incarnaria*. It came from Provence. — Egg oval, yellowish, marked with purple at one end. Larva rather slender, less tapering than many of the genus; head clay-coloured, body pale brown, ventrally dark fleshy; dorsal line fine, whitish, not interrupted, lateral line fine, geminate, dark purple. Polyphagous, feeding well on flowers. Pupa obtuse, shining yellowish, head and wings pale green. The moth is double-brooded, flying in June and September, and is much more abundant some years than others. Distributed on the Mediterranean, excepting perhaps Spain.

palmata.

Pt. palmata Stgr. (= *unostrigata* Rbl. nec Baker) founded on a single ♀ from Palma, Canaries, is said to be similarly coloured to *Acidalia corcularia* (*ochroleucata* ab.) but larger, narrower-winged. Forewing with costal margin straight, apex very acute, distal margin strongly oblique. Expanse 19 mm; colour very pale dull reddish yellow with weak and sparse dark dusting; blackish discal dot present on both wings; the strongest

marking is a nearly straight dark median shade, indistinct and immediately following the discal dot on the forewing, strongly blackish-dusted and considerably before the dot on the hindwing; subterminal line very broad, only slightly waved, bordered on each side by a pale reddish line; distal marginal line fine, dark; fringes with blackish dots at the base. Underside very pale, forewing scarcely dusted with grey, a whitish stripe before the distal margin. Taken near Los Sauces, 25 August 1889, in a damp place among *Mentha pulegium*.

Pt. eugeniata Mill. (= *seeboldiata* Rössl.) (4 e). Nearest in colour to the less pinkish red forms of *incarnaria* but on an average larger, rather brighter and readily distinguishable by the markings, which slightly recall, as MILLIÈRE says, those of the genus *Cosymbia*, a greyish median shade being present and the postmedian line denticulate on the veins or almost broken up into conspicuous dark vein-dots. Antemedian line weak, curved, often obsolete; discal dots distinct; distal marginal line, as in *incarnaria*, best developed beneath; fringes with conspicuous black dots at base; costal margin of forewing, both above and beneath, more yellowish, as in *incarnaria*. Under surface much less reddish, the hindwing pale, the forewing usually somewhat suffused with greyish; discal dots and median and postmedian lines usually well expressed. The structure shows no material difference from that of *incarnaria* and *obsoletaria*, the ♂ antennal ciliation being very short and the hindtarsus extremely abbreviated. I am not acquainted with any account of the early stages of this local species. It was discovered on uncultivated land near Marseilles, flying in July, and has since been found in Spain, particularly in the vicinity of Bilbao. I have recently seen some variable examples from Gibraltar, collected by Captain J. J. JACOBS.

Pt. oranaria Bang-Haas from Southern Oran, is said by its author to be probably best placed in the vicinity of *eugeniata*, from which however it differs essentially in the long ciliation of the ♂ antenna. The leg structure is not described. Reddish grey-brown irrorated with blackish. First line (on forewing only) present but weak, emphasized by black dots, especially at the posterior margin. Postmedian line strongly developed on both wings, consisting of a series of very distinct black vein-dots in part connected by a fine line; its course almost exactly as in *eugeniata*. Both wings with distinct black discal dot. Fringes concolorous, with strong black dots at the ends of the veins. Hindwing regularly rounded. Underside dirty yellow-brown with weak blackish median shade, distally to the discal dot, and very weak postmedian consisting of dots on the veins. The black dots on the fringe are also much weaker than above. Expanse 20—22 mm (22—24 mm, English measuring). Only two specimens known, the ♂ more strongly marked than the ♀.

Pt. helianthemata Mill. (= *obsoletaria* part Mill. nec Rbr.) (7 d) is in its typical form a quite unmistakable species, recognizable by its small size, reddish ochreous colouring and narrow blackish median band on both wings. The ground-colour is on an average rather lighter in the ♂ than in the ♀, which latter is often almost more red than ochreous; according to MILLIÈRE very light naples yellow forms also occur in both sexes. The other lines vary in strength of expression but are seldom very strong; they are bent or curved near the costal margin of the forewing. The cell-spot of the forewing is concealed by the median band; that of the hindwing is distinct, placed distally to the median band; the fringes bear strong black dots opposite the veins. The under surface is a little paler than the upper, with the markings rather more strongly fuscous. The wings are rather, but not extremely narrow, the hindwing with moderate or rather shallow excision between the radials. ♂ antennal ciliation short, hindleg short and weak, tarsus strongly abbreviated. According to MILLIÈRE extraordinarily variable, aberrations occurring, nearly as frequently as the type form, in which the median band is entirely wanting, producing a very different impression and resulting in some confusion with *obsoletaria* Rbr., but distinguishable by their smaller size and more pointed forewing. I would add that the hindwing of *obsoletaria* is not excised between the radials. MILLIÈRE himself first figured this aberration under the erroneous name of *obsoletaria*, where it is still quoted with a query in STAUDINGER's Catalog; later he corrected his error and figured other examples of it under the correct name. It appears that they are also often of a lighter colour, like that of *obsoletaria* or *sylvestriaria*. As I have not seen them in nature, and have only a pair of typical *helianthemata* before me, I abstain from naming the form; especially as I think it not unlikely that it may prove identical, except in size, with my new *substraminata*. MILLIÈRE says that the two forms fly together, throughout July, while *obsoletaria* is on the wing a fortnight later, and never in the same localities. He does not explicitly indicate whether he has ever bred his two forms from the same larvae. The larva is short, tapering anteriorly, carinated laterally; ochreous greyish, the markings ill-defined; dorsal line slender, brown, showing on the thorax and last few segments, broken into a sagittate pattern on the intermediate segments; subdorsal fine, brown; lateral pale, uninterrupted; head small, globular. Polyphagous, feeding on dry leaves or flowers; grows very slowly, spending at least 10 months in the larval stage, sometimes 12 months. Pupa of medium proportions; reddish yellow. The moth loves the sunny clearings in woods, and inhabits Southern France and Catalonia.

substraminata. **Pt. substraminata** *sp. nov.* (praec. subsp. ?) (7d) is larger on an average than *obsoletaria*, the ground-colour less bright, similar to that of *sylvestraria* (= *straminata*) or slightly paler, with similar scattered black atoms. Vertex of head white (in the only two *helianthemata* which I can examine it is strongly tinged with ochreous). The ♂ antennal ciliation agrees with that species, the hindtarsus appears even more strongly abbreviated. The position of the markings seems to agree essentially with that of *helianthemata*, including the placing of the discal dots; but the median shade is scarcely at all thickened and in most specimens no more conspicuous than the postmedian. The black dots on the fringe are usually smaller or weaker, in one or two aberrations nearly obsolete. Under surface towards base (especially of the forewing) rather more strongly dark-dusted; cell-spot and median and postmedian lines usually fairly distinct. The to me unknown *mancipata* *Stgr.* cannot be identical with this species, on account of its long antennal ciliation. I have already expressed a doubt whether it may be a form of MILLIÈRE's *helianthemata*-aberration, but Herr PÜNGELER has sent for my inspection a pair from Cuenca, 25 June 1906 (M. KORB) as a species for which he cannot find a name. My own specimens (type and cotypes) are from La Granja, 1500 m, July 1904 (T. A. CHAPMAN) and Tragacete, July 1901 (T. A. CHAPMAN). Thus it is evidently somewhat distributed in Spain. Rather variable; the type and a second La Granja ♂ are rather pale and rather strongly marked, the Cuenca pair also strongly marked but not quite so pale; the other two from La Granja (♂♀) are pale but with the lines much weaker; the two from Tragacete (♂♀) are more tinged with reddish ochreous, especially the ♀, the lines moderately developed.

capnaria. **Pt. capnaria** *Püng.* (= *cineraria* *Bang-Haas*, nec *Leech*) (3 h). Ground-colour glossy pale brownish grey, so strongly and uniformly dusted with fuscous as to make this latter appear to be the prevailing tone. Costal edge of forewing basally darkened. Cell-dots present, at least on hindwing, but usually not conspicuous. Antemedian line weak or obsolete; postmedian strong, following nearly the same course as in *ostrinaria*. A very faint dark outer shade indicates the proximal boundary of the subterminal line. Under surface similar but lighter. Differs entirely in colour from *ostrinaria*; also structurally in having less extremely short antennal ciliation in the ♂ and longer hindtarsus — in *capnaria* much more, in *ostrinaria* much less than half the length of the tibia. Only known from Beyrout.

ostrinaria. **Pt. ostrinaria** *Hbn.* (4 e). A pretty and easily recognized species of a rather bright yellowish tone, dusted and suffused with red, especially at the costal margin of the forewing and over the whole hindwing; base of costa of forewing more purple. Forewing with a distinct, sinuous, purple postmedian line, nearer the distal margin at the costa than at the posterior margin, rather strongly indented shortly before the latter; distal area in posterior half more or less strongly purple. The other lines on forewing and the lines on hindwing fine and weak. Discal dot present on forewing. Under surface pale straw-colour, hindwing unmarked, forewing darkened at base of costa, discal dot and postmedian line present, distal area with a duller, weaker purplish suffusion than above. ♂ antennal ciliation extremely short; hindtarsus greatly abbreviated. — *ab. oenoparia* *Püng.*, *ab. nov.* (= *purpuraria* *Trti*) (3 h). Both wings entirely overspread with purple. S. Spain, Murcia, Sierra d'España, 2 ♀♀, M. KORB, end of June 1909; S. Portugal, Algarve, 2 ♂♂, Dr. JORDAN, 1910". Renamed *purpuraria* by TURATI (on 3 ♀♀ from Sardinia) after the appearance of our plate. — The egg is oval, apparently with the usual sculpturing; whitish yellow at first, becoming flesh-coloured with a red spot at one end. The larva is short, tapering anteriorly, carinated laterally, strongly rugose; head small, retractile, body with fine, well developed hairs, which — at least towards the hibernating stage — are recurved at the tip so as to attach to themselves the pollen of the flowers in which the larva is feeding, forming a clothing which is quite exceptional in this genus; reddish brown with rather pale lateral line; the middle segments with light, sometimes white, heart-shaped dorsal spots; ventral surface concolorous, with pale lozenge-shaped markings. Lives on various low plants, feeding successively on the pollen, the stamens, the petals and the leaves. Imago in June, in all the Mediterranean countries.

purpureomarginata. **Pt. purpureomarginata** *Bhtsch.* The unique type-specimen of this species is unfortunately in a bad state of preservation, having apparently been injured in relaxing. It has recently passed into the PÜNGELER collection. Herr PÜNGELER considers it a good species, near *ostrinaria* (as also BOHATSCH indicated); in any case it has nothing to do with *exilaria* *Guen.*, to which STAUDINGER has referred it. Clay-yellow, duller than *ostrinaria*, vertex of head concolorous, not white as in *ostrinaria*; forewing with a distinct antemedian line present, a median line and discal dot indicated, the postmedian less incurved in its posterior part, running nearer to the distal margin, the purple costal margin somewhat more extended, the purple dusting of the distal area densest towards the margin, a slender, dentate subterminal line of the ground-colour indicated; hindwing with the two lines (median and postmedian) distinctly visible, only the distal area strongly dusted with purple, containing a slender subterminal line. Under surface more tinged with red than in *ostrinaria*, redder distally, with postmedian line present, distal marginal line violet-black, fringes reddish at base. Structurally also *purpureomarginata* is differentiable, the wings being more elongate, the ♂ antenna more strongly ciliated and the hindtarsus decidedly shorter. Syria: Beyrout district.

Pt. circuitaria *Hbn.* (= *chimaeraria* *Mill.*) (4e). A very distinct species. May be known at once *circuitaria*. by the bright sand-coloured areas which alternate with narrow or broader whitish stripes. The lines are fine and somewhat sinuous, darker than the sandy areas which they bound; the median shade is wanting, or rather is represented by the broad central sandy band; the first line is also, as usual, wanting on the hindwing; subterminal line whitish, often broadened so as almost to reach the distal margin; cell-spots wanting. Under surface similar, forewing with the first line absent, both wings with the median shade a little darkened in places, with the suggestion of a dark discal lunule on both wings. ♂ antennal ciliation short; hindleg short but not thickened, tarsus not greatly abbreviated. *chimaeraria* *Mill.* was named from specimens which were dwarfed through breeding, and therefore does not represent a genuine aberration. — ab. **mimosaria** *H.-Sch.* is a *mimosaria*. whiter form, the stripes or bands being broadened and of a pure white. It occurs with the type in several localities but is, according to STAUDINGER, the only form known from Northern Asia Minor. — The larva is slender, tapering somewhat anteriorly and carinated laterally, but is singular in the form of the head and prothorax which, as in so many *Hemitheinae*, project in a double point above; the colour is reddish brown, with a fine, geminate, uninterrupted brown dorsal line, a rather broad, much interrupted subdorsal and a fine, pale, interrupted lateral line; the spiracles are extremely minute, black, ringed with whitish. It appears to be polyphagous and shows a decided preference for decaying leaves. It is difficult to rear. The pupa is clay-yellowish, dorsally spotted with brown. The moth appears in June and July and is local and rarely abundant. It inhabits S. W. Europe, Sardinia, Corsica, Italy, Dalmatia, Syria and Northern Asia Minor. Also in dry mountains near Philippeville, Algeria (Dr. A. SEITZ).

Pt. effusaria *Chr.* (= *obtectaria* *Leech*) (3 i) may be regarded as having the same scheme of markings *effusaria*. as *circuitaria*, but less sharply defined, the ground-colour being pale ochreous or, at lightest, an impure, yellowish white and the rather darker areas somewhat shadowy; the postmedian line makes a very strong distal curve between the third radial and second median, otherwise it is placed rather far from the distal margin, especially on the hindwing. Under surface paler with the markings still weaker. ♂ antennal ciliation short; midtibia fringed with long hairs; hindtibia strongly hairy, hindtarsus aborted. Originally described from the Ussuri district. I have before me a single ♂ from thence, perhaps a pale aberration but apparently slightly worn or faded. The Japanese examples are slightly larger and more ochreous, but as both CHRISTOPH and LEECH indicate this as the ground-colour I do not feel justified, without further material, in separating the two races. In any case there is no doubt as to the specific identity. The original examples were taken in the second half of July; in Japan it continues on the wing until mid August.

Pt. auricruda *Btlr.* (= *plumboscriptaria* *Chr.*) (3 i) is quite distinct from *effusaria* in its darker colouring, *auricruda*. etc., although it still has, in common with that species, a rather strong gloss which prevents the markings from standing out quite as sharply as in our figure. The ground-colour is of a more brownish ochreous than in *effusaria*, the bands (on forewing 4, on hindwing 3) of a peculiar, indefinite chocolate-brown tone, angled, varying in width, sometimes (as in our figure) fully as wide as the bands of the ground-colour, sometimes considerably narrower. Underside much paler, the markings more blurred. ♂ antennal ciliation rather short, hindtibia short, strongly tufted with hair, tarsus about one-half as long as tibia. S. E. Siberia, Korea and Japan, end of June—July. — **insuavis** *Btlr.* (= *remissa* *Wilem.*) is in my opinion nothing more than an extreme form of *auricruda*. It was described and figured from Dharmasala by BUTLER and seems to constitute a local race in N. India; but *remissa* *Wileman* is in all respects identical with it and at Yoshino in the province of Yamato this occurs together with typical *auricruda*. *insuavis* differs from the type form in being of a duller, more purplish-lead tone, the pale ground-colour being reduced in width so that it may rather be described as 3 (on the hindwing 2) broad sinuous lines on the otherwise uniformly dark wings. MEYERICK and TURNER record this species (under the name of *plumboscriptaria*) from N. Queensland; according to the very brief description given, it would appear to be a form slightly different from both those here described, or possibly a very close ally.

Pt. herbariata *F.* (= *pusillaria* *Hbn.* nec *pusillata* *Schiff.* = *microsaria* *Bdv.*) (4e). As a thorough *herbariata*. study of the literature has necessitated a few changes in well-known names among the *Acidaliinae*, it is so much the greater satisfaction to find that in the present species no alteration is necessary. Although HÜBNER's name of *pusillaria* is now almost certainly known to date from 1796, two years prior to *herbariata*, it was founded on a misidentification of SCHIFFERMÜLLER's *pusillata* and has therefore no standing according to the rules of nomenclature. It is, however, possibly the *inquinata* of SCOPOLI, as WERNEBURG thinks. A small species, moderately variable, but not difficult to recognize. The wings are rather broad, apex of forewing not acute. Ground-colour whitish ochreous, rather strongly and coarsely dusted with fuscous. Forewing with both lines well developed, the antemedian curved, the postmedian angled near the costal margin, both with an inward bend near the posterior margin, the antemedian often thickened at the posterior margin; median shade much more variable, almost always dark and thick at the posterior margin, but seldom distinct

throughout the wing; it is either placed very near the antemedian, in which case it is often united with it to form a very narrow band or bar, or the space between the two is slightly darkened, or it is on the posterior margin midway between the lines and becomes vague in the middle of the wing, sometimes more strongly expressed again as a costal spot; the postmedian line, which is rather far from the distal margin, is followed by a very narrow pale space or line, then by broad fuscous shading disposed in three blotches (somewhat as in *eburnata*), the broad whitish subterminal line encroaching very deeply between them; the area beyond the subterminal less darkened, so that in some lights the wing almost appears to be divided into two areas, an extensive dark one ending in strong projections at the subterminal and a narrow paler one beyond; cell-spot distinct; large roundish black dots at base of fringe. Hindwing with antemedian line wanting, postmedian more irregular, unusually close to the cell-spot, leaving about half the wing beyond it, on which the pattern is about as on the forewing. Under surface pale, almost without a trace of markings, the forewing, at least costally and distally, and the extreme distal margin of the hindwing a little darker than the rest, the subterminal line sometimes traceable in purer white. ♂ antennal ciliation minute; hindtibia very short, thickened, tarsus considerably less than one-half the length of tibia. — *aestiva* Fuchs is the second-brood form, smaller and more weakly marked, in particular with the distal dark markings less developed. I have some doubts, however, whether its differences from the first generation, except perhaps that of size, are sufficiently constant to afford a genuine example of season-dimorphism. — *adherbariata* Stgr. (= subherbariata Stgr., nec Rössl.) is a still paler and more weakly marked form which STAUDINGER thinks replaces the type in Palestine and Syria but occurs with it as an aberration in the Amasia district and Armenia. I have not seen it, and as REBEL has united it with the preceding as a mere aberration, it is possible that recent material has shown it to be inconstant everywhere. — The egg of *herbariata* is nearer round than oval, yellowish at first, changing after two days to salmon-colour. The larva is extremely variable in colour, and has been rather fully described in its different stages by HEYLAERTS. Its fourth and last moult takes place in the spring. In its last stadium it is thickened posteriorly, attenuated anteriorly, the head small, the body carinated laterally, strongly rugose and granulated; head yellowish or reddish (according to FISCHER VON RÖSSLER-STAMM blackish brown), bordered with black; body brown, yellowish or greenish; prothorax with a blackish, or blackish-bordered dorsal plate; dorsal line double, most noticeable on the first 5 abdominal segments; subdorsal blackish, very variable in expression, on the 6. and 7. abdominals curved so as to form with the dorsal a lyre-shaped pattern; ventral area paler, marked with numerous short black longitudinal streaks. Appears to feed exclusively on dry plants in herbaria, in herbalists' stores, etc.; it is probably indiscriminating in its selection of these, HEYLAERTS found it feeding on *Malva sylvestris*, SORHAGEN on *Sanicula*. It feeds during the winter, and is full-fed in April or May. Pupa shing light-brown with darker segmental incisions and head; cremaster dark brown with the usual hooked bristles. The moth appears at the end of May and in June—July and is usually only single-brooded, at least in its more northerly localities. It is found sitting on walls or fences, or especially in houses or warehouses. Central and Southern Europe, N. Africa, Asiatic Turkey and Transcaucasia.

fimbriata.

Pt. fimbriata Bang-Haas should probably, to judge by the description, be placed here. It is of a weak brownish straw-colour, only very sparsely dusted with black scales. The lines have almost exactly the same course as in *laevigata*, the antemedian thickened into black spots at the costal and posterior margins, the postmedian somewhat more sharply bent on the 1. and 2. median veins than in that species; in places the lines are somewhat strengthened by dots on the veins. Subterminal line yellowish white, rather distinct, formed as in *herbariata*. Fringes with black dots at the vein-ends. The dark median shade is wanting on both wings. Discal dots strong and distinct. On the hindwing a weak postmedian line is placed as in *herbariata*, a still weaker, shadowy proximal line is visible posteriorly, but becomes almost obsolete at the costal margin; the outer half of the hindwing shows a weak, *herbaria*-like subterminal line. Under surface glossy white-grey, unmarked except for the weak discal dots. Antenna shortly ciliated. Described from 1 ♂ and 1 ♀ from Beyrout, Syria, the male rather yellower than the ♀. No critical differentiation from *herbariata adherbariata* is given, but I suppose the colour, the absence of median shade and perhaps larger discal spot would distinguish it.

affinitata.

Pt. affinitata Bang-Haas (= *semifuscaria* Püng. i. l.) (3 i) also probably belongs in the vicinity of *herbariata*, with which it closely agrees in structure, shape and coloration, though the wings appear rather less glossy; ♂ hindtarsus rather longer. BANG-HAAS says that it reminds somewhat of *laevigata* and that the wings are somewhat more pointed than in *fimbriata*. The discal dots are larger, the postmedian line on the hindwing not quite so close to the dot as is usual in *herbariata*, the characteristic shading proximally to the subterminal weak on both wings; but the essential characteristic of *affinitata* is the strong basal clouding of both wings which on the forewing reaches to just beyond the discal dot (though fading out costally) and renders the angled antemedian line very indistinct, while on the hindwing it is more restricted, ceasing before the discal dot. Forewing beneath more infuscated than in the two preceding species; both wings with the postmedian line indicated. Beyrout, Syria.

Pt. holliata *Homberg*. I am unacquainted with this species, but it has been carefully described and compared with *herbariata*. Dirty white, glossy, washed with brownish, paler and less reddish than in *herbariata*. all the lines composed of blackish brown scales. Forewing slightly narrower and less rounded at apex than in that species; base irrorated with brown, especially costally; antemedian line more angled, more oblique at the costa, where it arises from a better defined brown mark, marked by a blackish brown spot on the median vein and rather sharply angled on the posterior fold; median shade distinct, oblique at the costa, rather sharply angled beyond the discal dot, round which it bends, and forming a small angle inwards on the fold; discal dot larger, more strongly expressed and rounder than in *herbariata*; postmedian more strongly marked at the costa than in that species, angled outwards on the 1. radial, slightly inbent on the fold and again with a small distad angle near the posterior margin; the space between this line and the distal margin much less broad than in *herbariata*, the subterminal spots smaller and less confluent; distal marginal line fine, interrupted at the veins; fringe with a series of brown dots at base. Hindwing similar; discal dot as strong as on the forewing; postmedian angled, better expressed than in *herbariata*. Under surface glossy, lighter than in *herbariata*, the postmedian line sharp on both wings; this character distinguishes it immediately from *herbariata*. Vertex, head and face brownish white. Antenna in ♂ very shortly ciliated. Body brownish white, lighter and more yellowish beneath. Legs yellowish white; hindtarsus of ♂ much less aborted than in *herbariata*, slightly longer, but less broad in the first two joints than in *laevigata* *Scop*. Described from several examples of both sexes from Akbes, Syria. In shape, in the large discal dots, the presence of postmedian line beneath, etc., it must resemble *affinitata*, but the paler colour and absence of the characteristic infuscation should denote at least a local race. HOMBERG was perhaps not acquainted with *affinitata*; at any rate he makes no mention of it in his description.

Pt. improbata *Stgr.* (3 i). Not a very striking species and unfortunately only known to me in the *improbata*. ♀. It was described from 3 ♀♀ and 2 of the same sex lie before from the PÜNGELER collection. Pale sand-colour, somewhat variable in intensity, the markings not very strong; discal dots present. Forewing with the lines following perhaps nearly the same course as in *herbariata* but much further apart, the postmedian being placed nearer to the distal margin; median shade obsolete or faintly indicated; beyond the postmedian a narrow band is sometimes fairly well defined, sometimes more broken into three blotches or pairs of spots more as in *trigeminata*, sometimes obsolescent; dots at base of fringe small, hardly conspicuous. Hindwing very slightly suffused basally, the distal half marked as on forewing. Under surface with distinct or moderately distinct postmedian line and sometimes sufficient darkening in the distal area to render discernible the pale subterminal. In some respects this species recalls very slightly a weakly marked form of *biselata*, though the colour is quite different. Palestine: Jordan Valley.

Pt. calunetaria *Stgr.* (= *doryeniata* *Bell.* = *callunata* *Rbr.*) (4 e). Rather longer-winged than most *calunetaria*. of the *seriata*-group, in this respect intermediata towards *longaria*. Should probably be placed nearer to *seriata* than in STAUDINGER's Catalog, but the ♂ antennal ciliation is minute and the hindtarsus extremely short. Whitish with coarse grey dusting, the discal dot black and the lines strongly expressed; first line of forewing sharply angled near costa, becoming extremely oblique; postmedian with small dark teeth on the veins and with an unusually strong distad bend in the middle, so that in some specimens a letter M is suggested on the 3. radial and 1. median; some dark shading follows the postmedian; distal margin with an interrupted dark line. Hindwing with much straighter median and postmedian lines. *Pt. calunetaria* was discovered in Andalusia, frequenting pinewoods where *Calluna vulgaris* was plentiful, and flying rapidly. It seems confined to Spain and S. France, local. — **valesiaria** *Püng.* (4 e) which represents *calunetaria* in Valais, and occasionally occurs as *valesiaria*. an aberration in other localities, is as a rule decidedly larger, the ground-colour a more brownish white, the dusting apparently rather less coarse, the lines less sharply expressed, but otherwise it agrees entirely with the type form. It is found resting on rocks on the warm slopes of the mountains. — The larva of *calunetaria* was first made known by BELLIER, described from larvae found feeding on *Dorycnium*; like most of the genus, however, it feeds readily on withered or dry leaves of various low plants. It is rather elongate, though not so slender as that of *seriata*, tapers anteriorly, is somewhat flattened dorsally and shows the usual lateral ridge; head small, bilobed; dorsal area reddish grey or darker earth-grey (in *valesiaria* described as wood-brown) usually indistinctly marked, occasionally, at least in the type-form, with a series of blackish sagittate spots; mediodorsal line fine, most distinct anteriorly, more or less dark-shaded posteriorly; subdorsal line wanting; lateral ridge lighter, dark-shaded below; ventral area rather dark grey. Pupa pale yellowish brown, with 4 rows of dark spots; head and wings more greenish, the wing-veins distinct, being dark outlined. In Spain the moth flies in May, July—August and sometimes again in October. Also in Valais it seems to be at least double-brooded. The form *valesiaria* superficially resembles *mareotica* *Draudt*, which, however, may be known at once by the irregular margin of the hindwing and the less deep bend in the postmedian line of the forewing, besides the structural differences of the ♂.

elongaria.

Pt. elongaria Rbr. (= *aridata* Zell. = *infermata* Rbr. = *zephyrata* Mill.) (4 f) is another slightly long-winged species, though the name is scarcely happily chosen in a genus which contains much more extreme forms. Dirty whitish grey, with a tinge of bone-colour, sparsely sprinkled with rather strong black atoms; discal dot and dots in fringe black, distinct; the dark lines and shades not very strong, the lines, however (especially the postmedian), punctuated with black dots or dashes on the veins; first line of forewing angled near the costa and becoming oblique, though less extremely than in *calunetaria*; postmedian much more normally formed than in that species, namely with a proximal bend costally (where, however, it is often obsolescent) and gentle proximal curves between the radials and posteriorly; median often obsolescent, rather oblique, as a rule considerably proximal to the cell-spot on the hindwing; subterminal line somewhat lunulate-dentate, but seldom noticeable; the accompanying shades being as a rule extremely weak. Forewing smoky beneath, the postmedian line and pale subterminal usually rather distinct; hindwing nearly white, the postmedian usually present, sometimes also some rather smoky distal shading, in which case the pale subterminal becomes distinct. ♂ antennal ciliation minute; hindtibia thickened, hindtarsus abbreviated, scarcely one-third as long as tibia.

monadaria.

— ab. **monadaria** Guen. is a dwarf form with the median shade wanting and also with a tendency — if I am right in referring here an aberration of rather frequent occurrence in Syria — for the other lines to become weak or obsolete, recalling HERRICH-SCHÄFFER's figure and description of his *troglodytaria*. I do not know of any locality where this *monadaria*-form entirely replaces the type, and as I have no dated material I am

pecharia.

not able to conjecture whether it may be seasonal. It was described from Tarsus. — **pecharia** Stgr. is a very distinct local race from Hungary, S. E. Russia, Transcaspia and the Ili district, giving the impression of a quite distinct species but apparently in reality only differing in having both wings above and beneath entirely suffused with smoke-colour, the dark scales being so dense as to leave only very slight traces of the pale ground-colour, occasionally a slender pale line being noticeable as a distal edging to the postmedian; the dark lines and cell-spots are discernible though not conspicuous; the fringes less strongly darkened, the black dots there in consequently well visible. I have not seen specimens from Asia Minor, where a transitional form is said to occur; but even at Buda, a well-known locality for *pecharia*, an occasional specimen is much less extreme than the majority. — The egg of *elongaria*, according to a figure by MILLIÈRE, resembles those of *Acidalia* in having very strong longitudinal ribs and much slighter transverse ones. Larva moderately elongate, attenuated anteriorly, folded, appreciably carinated, head small, flattened in front; clay-colour, darkest on the anterior and posterior segments; a broad pale mediodorsal line, no other dorsal markings; lateral line equally pale and broad; metathorax and first two abdominals each with a large black spot placed above the spiracles; spiracles very small, black, invisible to the naked eye. Pupa light brown, dark-spotted dorsally, the wing-veins dark-outlined. Double-brooded, flying in June—July and again in August—September. Distributed throughout Southern Europe, N. Africa and from Asia Minor to N. Persia.

effeminata.

Pt. effeminata Stgr. from Margelan, N. Ferghana, is described as being nearly the same size as *elongaria*, on an average slightly smaller, but easily to be distinguished by being altogether much less sharply marked, only the black discal dot being distinct; the black dots on the base of the fringes are either altogether wanting or at best quite indistinct. The ground-colour is dirty white-grey, somewhat tinged with yellowish, quite similar to certain *elongaria*; the dark dusting is sparse and very fine, never so coarse and black as in *elongaria*; in some specimens a very weak median shade is present, passing just distally to the cell-spot on the forewing, proximally to it on the hindwing; all show two weak dark lines towards the distal margin (postmedian and inner subterminal?); distal marginal line rudimentary. Under surface similarly coloured, only in a few specimens with the forewing slightly infuscated, the cell-spots present, the other markings almost or quite obsolete. ♂ antennal ciliation quite short, as in *elongaria*; hindleg greatly aborted, shorter than in *elongaria*.

biselata.

Pt. biselata Hufn. (= ? *fimbriata* Schiff. = *bisetata* Rott. = *dilutata* Haw. nec *dilutaria* Hbn. = *cinereata* Stph. nec *cinerata* F. = *reversaria* Dup. nec *reversata* Tr. = *scutularia* Ver-Huell nec *scutulata* Schiff.) (4 f). Pale straw-colour, sprinkled with fuscous scales. Forewing with first line fine, often not very distinct; median shade following (sometimes touching) the strong black discal dot; postmedian denticulate, nearly parallel with termen; distal area more or less shaded with fuscous, a rather thick strongly waved subterminal consequently distinct; fringe with sharp black dots at base. Hindwing without first line, median somewhat undulate or more strongly irregular (with strong proximal curve in cell), always well proximal to the discal dot. Under surface similar, forewing slightly or strongly infuscated from base to median shade, first line wanting. ♂ antennal joints slightly projecting, ciliation even, about (or scarcely) as long as diameter of shaft; hind femur hairy, tibia broadened and clothed on the outer side with long strong brushes of light hair, some of which reach at least to the end of the tarsus, and with a strong expansible tuft of fuscous hair on the inner side, arising from the femora-tibial joint, tarsus rough-scaled, perhaps somewhat hairy, scarcely half as long as tibia. Variable chiefly in the distal-marginal dark shading; this is occasionally (though rarely) almost confined

to the proximal side of the subterminal line, still more rarely broken up into spots, in which case it somewhat recalls that of *trigeminata*, but is much more vague. The two extreme forms have received separate names. — ab. **fimbriolata** Steph. (= *schaefferaria* F. Fuchs) is a pretty form in which the distal bordering is intensified, being darker in colour and occupying, in equally strong expression, the entire distal area of both wings excepting a somewhat narrowed, or even interrupted, subterminal line. The basal area of the forewing above also shows a tendency in this form to become slightly infuscated. — ab. **infuscata** nom. nov. (= var. *infuscata* B. Guen.) has both wings uniformly powdered over with grey-black, obscuring the markings. I have seen a good example from the LEECH collection and BARRETT also mentions the form, but it is always rare. — **extincta** Stgr. (= ? *crinitaria* Stgr.) though likewise merely a chance aberration in Western Europe, seems to be a constant race, or subspecies, in the East (Siberia, ? China, Korea, ? Japan) and even in Prussia and Russia is of perhaps more frequent occurrence than further west. In it the dark distal shading is entirely or almost entirely obsolete. It is curious that STAUDINGER in erecting his *crinitaria* (on a single worn specimen from the Sutschan district (southern Ussuri), did not even compare it with his *biselata* var. *extincta*, which was made known at the same time. It may be that the inner tuft of dark hairs on the hindtibia, which is emphasized in the description, is even stronger and blacker or that the "weakly and bluntly angled hindwing" (not shown in the figure) points to a distinct species, but in any case it must come very close to *biselata*, not to the *aversata*-group. The figure recalls *invalida* Btlr. — The egg is obtusely oval, somewhat depressed, with fine shallow pitting; salmon-colour with large darker spots (probably pale yellowish when first laid). The larva is rather thick from the 3rd to 6th abdominal, with marked incisions, anteriorly tapering to the very small head; skin rugose; dull brown or yellowish brown, darker dorsally; dorsal dark line double, ill-defined; 1st—5th abdominals usually with blackish V-shaped dorsal pattern, the arms of the V directed caudad, the apex somewhat broken off, at the front of the segment; setae small, knobbed at the tip. Rather strongly variable in colour and in the distinctness of the markings. Very sluggish and as a rule growing slowly, but sometimes producing a partial second brood; polyphagous on low plants. Pupa light brown, head and wing-cases greenish. A widely distributed and in many places common or even abundant species; easily disturbed from bushes by day and rather active on the wing from early dusk; sometimes attracted by light or sugar. Central Europe, Bithynia, Transcaucasia, E. Siberia ec. June—July.

Pt. decidua Warr. (= *holosericeata* Btlr. nec *holosericata* Dup.) (7 d) might have been regarded as a form of *biselata* *extincta*, from which it shows very few differences, but for the fact that the tufts of hair on the ♂ hindtibia appear considerably less strongly developed and lighter in colour. Rather smaller and paler, rather weakly marked. Whitish ochreous, almost or entirely without dark dusting, the lines only marked in somewhat darker ochreous, the subterminal shades, as in *extincta*, usually almost entirely obsolete; discal dots minute but distinct, dots on base of fringe very minute, sometimes obsolete. Hindfemur and hindtibia of ♂ tufted with whitish-ochreous hair, but not extremely heavily. Originally registered from Dharmasala, without description, under the erroneous name of "*holosericeata* Dup.", an error which remains uncorrected in HAMPSON'S "Moths of India". It seems widely distributed in the N. W. Himalayas in a succession of broods, April to September. — **delicatula** Warr., described from a single ♀ from Dalhousie, may very likely represent a rather large, strongly marked aberration, with better developed subterminal shade; but as it is intermediate in some respects between *decidua* and *biselata*, it can scarcely be referred decisively without the ♂.

Pt. denudaria spec. nov. (= *nudaria* Püng. olim, nec Chr.) (7 a). Possibly the eastern representative of *decidua* but slightly narrower winged. Whitish ochreous, the ground-colour about as in the well-known *fucovenosa* (= *interjectaria*) of Europe, but with weaker ochreous admixture, resulting in a paler and more uniform tone. Discal dots often obsolete; if present, then very minute, rarely at all distinct; dots at base of fringe minute and weak, or altogether absent; lines very faint, usually almost entirely obsolete, the entire wing-surface being the almost unicolorous, with only the costal edge narrowly of a rather more decided ochreous. Under surface also quite weakly marked, on an average less suffused than in *decidua*. Hindleg formed about as in *decidua*, with moderate, whitish-ochreous hair-pencil from base of femoro-tibial joint, extending for about the length of the tibia, the hair on outer side of tibia also whitish-ochreous; hindtarsus abbreviated. Ningpo, April 1886, ♂ (type) and ♀ in the British Museum collection; Nikko, a very weakly marked ♂ and ♀ in the PÜNGELER collection; a more strongly marked ♀ from Gensan, in the British Museum collection, probably also belongs here.

Pt. invalida Btlr. (3 h; as *invalidaria*; ? 4 m, fig. 4). Nearly related to *biselata* but apparently distinct. Ground-colour slightly darker (warmer or more brownish) the markings weak. ♂ hindtibia similarly formed but with the outer tufts of hair not quite so extremely developed, the inner tuft (pencil) longer but not so dark; the antennal ciliation may be very slightly longer, but shows no conspicuous difference. Hindwing

perhaps slightly narrower, at least in the ♂. Abdomen in ♂ long, but this is almost equally the case in *biselata*. Vertex of head brownish, concolorous with wings, collar scarcely darker; in *biselata* the vertex is pale, the collar much darker. Both wings with discal dot well developed, first line and median shade weak or obsolete, postmedian sometimes better developed, on an average slightly more sinuous and dentate than in *biselata*; distal area not or inappreciably darkened; dots on fringe usually quite weak. Under surface also a little more brownish than in *biselata*, especially the hindwing; markings usually rather weak. Some of the distinctions given appear, however, to be somewhat inconstant, or at least somewhat intermediate forms seem to occur in Central China, so that it is not altogether impossible that future investigations will result in sinking *invalida* as another race of *biselata*. — ab. *lauta* Warr. is an unimportant aberration in which both lines are strongly marked with black dots on the veins, the marginal dots also stronger than in the type. — *Pt. invalida* is widely distributed in Japan May-early July and again in September, the second-brood specimens and some others (especially ♀♀) very small; ? Central China, June—July.

perpulverea.

Pt. perpulverea Hmps. (7 b). Dull flesh-colour closely irrorated with olivaceous brown; the lines rather weak, formed by accumulation of the brown scales; first line (present on forewing) wavy or subdentate, a distinct distally-directed tooth observable on the second submedian; cell-spot of forewing large, elongate, slightly oblique; postmedian line fine, wavy, bent near costal margin, slightly incurved between the radials and more decidedly posteriorly; weak traces of a median shade between cell-spot and posterior margin; fringe dark-spotted at base. Hindwing with the discal spot smaller and less black. Under surface rather paler and more glossy, almost unmarked, forewing with a vague dark discal spot. Kashmir: Gooraise, the type ♀ (taken in June) from the LEECH collection, at present unique. In the absence of the ♂ and of very obvious affinity with any other known I am quite uncertain where to place this species, which is perhaps Indo-Australian rather than Palearctic. It bears some slight resemblance to some ♀♀ of *invalida*, but is more Eupitheciid in aspect, on account of the rather thick scaling, somewhat elongate forewing and especially the large discal spot of the forewing; the tone of colour is not altogether dissimilar to that of *Eupithecia expallidata* Guen., though rather duller and less glossy.

trigeminata.

Pt. trigeminata Haw. (= *scutularia* part. Hbn. = *reversata* Tr. = *bisetaria* Dup. nec *bisetata* Rott). (4 f). Somewhat similar to *biselata*, with which it was sometimes confused by the early entomologists. Ground-colour in the fringes very weak; the dark distal markings on the contrary brighter and sharper, of a more chocolate-brown tone; costal margin dark from the base nearly to the first line; first and median lines weak or obsolescent, but starting (or at least the former) from dark costal spots; the dark proximal shading of the subterminal consists of paired spots, somewhat as in *dimidiata* but larger and sharper and with a strong confluent pair at the costal margin; distal dark shading of subterminal almost wanting. Hindwing with the paired spots smaller and weaker. It may also be remarked that the median shade of the forewing, when developed, is differently placed from that of *biselata*, being *proximal* to the cell-spot or occasionally crossing it. ♂ antennal ciliation as in *biselata*; hindleg similarly formed but with the tufts less extremely developed. Egg oval, with a large depression on the upper side; the entire surface with regular, somewhat hexagonal pitting; pearly white when first laid. Larva nearly cylindrical, but somewhat carinated laterally, tapering gradually from the 5th abdominal to the head; strongly rugose, segment-incisions deep; dull deep brown, dorsal line faintly paler, margined at the ends of the segments with thick black streaks; an ill-defined V-shaped dorsal pattern as far as the 5th abdominal much as in *biselata*, and an interrupted dark subdorsal; 6th abdominal with a whitish dorsal blotch; lateral ridge pale, interrupted at the incisions; ventral surface dark brown; setae curved, of equal thickness throughout, longer than in the allied species. The moth flies in May and June and there is sometimes a partial second brood, particularly in captivity; but I have found the larvae sometimes refuse to be accelerated in their growth even under the influence of increased temperatures. Locally common in Central and Southern Europe (except a considerable part of the Iberian Peninsula), Asia Minor and Transcaucasia. Its habits are similar to those of the preceding species. Not infrequently found by day resting on the upper surface of leaves like *Pt. rusticata*.

hispanaria.

- **Pt. hispanaria** Püng. sp. nov. (3 i). Expanse 22 mm. Near *trigeminata* Haw., larger, forewing more elongate, pale brick-reddish, markings similar, but much weaker, band of postmedian spots more or less obsolete, hindtibial hair-pencil not dark, hindtarsus longer. S. Spain, Murcia, Sierra d'Espuña, 4 ♂♂, 2 ♀♀, M. KORB, end of June 1909. Our figure gives a true impression of the ♂ of this quite distinct species; the only ♀ before me is smaller. The colour is more reddish than in even the brightest *invalida*, which is otherwise the most highly coloured species in this immediate vicinity.

rosco-fasciata.

Pt. roseofasciata Chr. I have not seen this species, but it should be easy to recognize by the coloration. According to its author it belongs in the neighbourhood of *biselata*, and the figure shows some resemblance in shape and in the general arrangement of the markings, at the same time the ♂ hindtibia has not the hair-tuft of *biselata* but is appressed-scaled. The ♂ antenna is described as "filiform", thus it

may be assumed that the joints do not project and that the ciliation is short; CHRISTOPH usually describes the dentate-fasciculate antenna as "pectinate". Light straw-yellow, the middle abdominal segments much darkened with blackish scales. Costal margin of forewing rather broadly brown-red from base to first line, reddish to the median line, the origin of both these lines marked with darker costal spots; first line weak, bent; median only slightly curved, closely followed (as in *trigeminata*) by the blackish discal dot; postmedian weakly bisinuate, followed immediately by a brown-red band which is constricted, but not interrupted, between the radials; subterminal not noticeable, the area from the band to the distal margin being of the ground-colour. Hindwing without first line; postmedian more deeply bisinuate. Underside similarly but somewhat more weakly marked, the band less conspicuous. Discovered at Ordubad in May in a rocky hollow. Inhabits Transcaucasia, the Central Taurus and Northern Mesopotamia.

Pt. terpnaria *nom. nov.* (= *amoenaria* Stgr. nec Snell.) (3i). Another easily recognized species, the *terpnaria*. band distally to the postmedian breaking off before the costal margin of the forewing. Probably related to the preceding species. The words used by STAUDINGER in describing it would indicate nearly, though not quite, as bright colouring; but the specimen before me, as here figured, is coloured like *trigeminata*, from which *terpnaria* differs in its considerably smaller size, narrower wings, with distal margin of hindwing less fully rounded, and in the arrangement of the distal markings. First line weak or obsolete; median sometimes indicated at the posterior margin; discal dot black; postmedian line strong, bisinuate, the following band not reaching the distal margin, though some suffusion is present between the pale subterminal and the margin. Hindwing sometimes somewhat suffused at the base. Under surface similar, the band tending to be reduced in width. ♂ antenna with rather short, even ciliation, hindtibia rather short and weak, not greatly dilated but fringed with hair above; hindtarsus shorter than tibia but not extremely aborted. Vladivostok, Askold, etc.; 3rd August is the only date known to me.

Pt. belemiata Mill. (3i). Distal bands much more reduced, consisting merely of a few confluent *belemiata*. posterior spots, somewhat as in some forms of *dimidiata*, but equally developed on both wings. The ground-colour should be a little more yellowish (clay-coloured) than in our figure. The lines are fine, bent near the costa; median shade not very strong; discal dots and series of dots at base of fringe present. Underside paler and weaker-marked: ♂ antennal ciliation rather short; hindtibia short and weak, but with a hair-pencil; tarsus quite short. Egg roundish, wax-white. Larva similar in form to that of *helianthemata*, rather short, tapering anteriorly and at the last few segments, head small, globular, dark brown; body flesh-coloured with fine dorsal and subdorsal lines and on the middle segments indistinct sagittate vinous markings; lateral line paler than the ground-colour. The moth is single-brooded, appearing in June and July, and is only known from Spain (Catalonia, Aragon, Andalusia) and Portugal.

Pt. politata Hbn. (4f). In its typical form a quite unmistakable species, the entire distal area of both *politata*. wings being filled up with dark, glossy violet-grey. The costal margin of the forewing is also more or less darkened. The ground-colour is glossy pale yellowish straw-colour (not so white as in our figure), the antemedian line usually and the median sometimes obsolete, the postmedian well expressed, but in the more darkly bordered specimens little differentiated from the bordering. Cell-dots sharply black. Fringe concolorous with wing. Under surface similar, costal margin of forewing less darkened, but the entire basal part of the wing sometimes with some dark suffusion. ♂ antennal ciliation short; hindtibia scarcely thickened, tarsus as long as tibia. Varies chiefly in the marginal dark band. This is sometimes a good deal lighter than in the specimen figured, and then shows a more or less distinct subterminal line of the ground-colour. — ab. **abmarginata** Bhtsch. (4f) is an extreme form, of not infrequent occurrence, in which the dark border is entirely wanting. In this form *politata* can easily be distinguished from the similarly coloured *biselata* *abmarginata*. *extincta* by the curve of the postmedian line, the more glossy scaling, generally smaller size and by the structural characters. The weakness of the proximal lines, strength of discal dots, etc., should render confusion with *fuscovenosa* or *dilutaria* quite impossible. *politata* is wanting in a great part of Spain, but otherwise is distributed though Southern Europe and from Asia Minor to Transcaspia and Persia; the form *abmarginata* is chiefly prevalent in Hungary and the Asiatic localities. Larva short and stout, strongly attenuated anteriorly, carinated laterally, the skin rugose, strongly folded; glaucous green, the 4th and 5th abdominal segments sometimes washed with fleshy, yellowish or bluish; dorsal line geminate, ill-developed; subdorsal wanting; lateral broad and paler than the ground-colour; a dark lozenge-shaped dorsal pattern on the 3rd—6th abdominals; ventral area pale bluish. Pupa moderately elongate, reddish yellow, washed with brown at the head and anal point. Imago at the end of June and in July, single brooded.

Pt. carpheraria Hmps. (= *unipuncta* Swinh.). Larger than *politata* and of an entirely different *carpheraria*. colour, besides wanting the dark grey border. Yellow, deeper towards the margins, the lines above obsolete or extremely faintly indicated. Both wings with large conspicuous black discal dot. Forewing beneath with the pale part more smoky, a dark smoky postmedian line and broader subterminal shade. ♂ antenna with

joints slightly projecting, ciliation moderate; hindleg slender, tarsus fully developed. Kashmir (Chamba, etc.) and the Punjab; thus perhaps belonging to the Indo-Australian fauna more than to Palearctic. Easily distinguished by the bright golden-yellow colouring, at least at the margins.

filicata.

Pt. filicata Hbn. (4f). Yellowish white, with purplish fuscous markings. Forewing with the median line preceding, or at most crossing the discal dot, becoming oblique inwards and with a rather marked indentation posteriorly; the entire area basally to this line more or less completely filled up with the dark colour, but usually with a pale line traceable proximally to the (scarcely visible) antemedian; postmedian usually obsolete, occasionally faintly discernible, but always marked by a conspicuous dark costal spot and often with another at the posterior margin; a cloudy, more or less interrupted dark shade proximally to the subterminal. Hindwing with the median line proximal (usually far proximal) to the discal dot, the space between this line and the base infuscated, but sometimes less strongly than on the forewing; postmedian line usually present, at least as a series of dots on the veins, placed near the discal dot; subterminal line usually followed as well as preceded by dark shading, hence more conspicuous than on forewing, broad. Under surface similarly but less darkly marked. ♂ antennal joints slightly projecting, ciliation short; hindtibia broadened and flattened, tarsus strongly broadened and flattened. Areole occasionally open at its extremity as in *Cleta*, the first subcostal failing to anastomose with the others. Larva rather thick, tapering anteriorly, the skin with strong transverse folds, rugose and granulated, but not so strongly as in *rusticata*; head light brown; body dirty greenish with indistinct, interrupted brownish dorsal and subdorsal line; lateral line more distinct, yellowish, broadening somewhat in the middle of the last segments; ventral surface without markings. Said to feed on flowers of *Dianthus*, *Veronica* and other low plants. The moth appears in June and again in September; it is distributed throughout the greater part of Southern Europe, Moravia, Hungary, Asia Minor and Syria.

bucephalaria.

Pt. bucephalaria Chrét., described from a single ♂, is said to resemble a small discoloured or aberrant *filicata* but to differ markedly, apart from other characters, in the large size of the head. Forewing narrow, prolonged at the apex, distal margin very oblique; yellowish white or very pale ochraceous, with scattered brown atoms, which only become condensed in the basal area; first line broad, sinuous and dentate, nearly direct, brown; postmedian very fine, punctiform, scarcely indicated, subparallel to the distal margin, discal mark small but strigiform, black, very near the postmedian, subterminal indistinct, fringes concolorous. Hindwing rounded, not emarginate; concolorous with forewing, basal area entirely covered with brown scales; discal dot very distinct. Under surface yellowish white, with the discal dots very small, black. Head large, blackish brown, vertex yellowish ochreous; antenna yellowish brown; body and legs yellowish ochreous; hindtibia without spurs, not more exactly described. Algeria: Biskra, end of May.

figuraria.

Pt. figuraria Bang-Haas is another recently described species with which I am still unacquainted. According to its author it has quite a distinct facies but is best referred to the *filicata-rusticata* group; the figure which he gives certainly suggests a near relative of these species. There are two colour-forms, one brown mixed with reddish, the other light grey-brown; the median area of the forewing forms a dark band, at its edges black-brown, in the middle lighter, bounded proximally by a wavy antemedian line, distally by the median, which is very strongly outcurved in its anterior half, so that the band is much narrower posteriorly than anteriorly; discal dot large and black, placed in this median area; postmedian line dentate, followed, as in *filicata*, by dark, broken band; distal marginal line black, interrupted; fringe spotted in places with brown. Base of hindwing darkened as far as the discal dot; postmedian line well expressed, strongly dentate; distal area somewhat darkened, though not so strongly as the basal. Under surface similarly but more weakly marked. Described from 3 ♀♀ from S. Oran. The shape will perhaps help to distinguish it from its allies; the apex of the forewing is rather sharp, the distal margin of both wings is said to be bent or slightly angled about the 3rd radial and 1st median, but the photographic figure does not show this appreciably on the fore-wing, and possibly BANG-HAAS scarcely intends to indicate more than the weakly flexuous margins which are shown by *rusticata*.

intermedia.

Pt. intermedia Stgr. (3i) suggests a weakly marked *filicata* but is structurally like *rusticata*. Wings shaped almost as in the latter, the distal margin of the hindwing between the radials and of both wings (especially the hind) between the first median and the anal angle being perceptibly, though only very slightly emarginate. Ground-colour slightly less white (more brownish or yellowish). Forewing with the dark band terminating at, or almost before the discal dot; its proximal edge (the antemedian line) not very conspicuous, as there is some dark basal shading, though not on an average so strong as in *completa*; postmedian line faint, starting from a dark costal spot; dark clouding between this line and the subterminal almost entirely obsolete; some minute dark dots, as in *rusticata*, stand at the base of the fringe. On the hindwing the basal dark shading is strong, the postmedian line weak or obsolete, subterminal dark shading obsolete. Under surface more weakly marked than in *filicata* and *rusticata*, especially in the subterminal region. ♂ antennal

ciliation short and even; hindtibia with a pair of well-developed spurs. Areole, as in *filicata*, sometimes open at its extremity. *Pt. intermedia* was discovered in Asia Minor, the first specimens being taken at light at the end of June and beginning of July; its range also extends to Syria and Mesopotamia.

Pt. completa Stgr. is perhaps merely the N. African form of *intermedia*. At any rate Herr PÜNGELER *completa*. has sent for my inspection a pair from Gafsa, Tunis, bred by CHRÉTIEN in October 1909, under the name of "*intermedia* e Mauretania" and they show no very essential differences; the structure seems identical. The dark band is somewhat wider, the median line being placed distally to the discal spot; the colour of the band is also somewhat more reddish, as in brightly-coloured forms of *rusticata*, from which it still differs in the course of the median line; the discal dots are rather smaller, especially on hindwing; the distal margins also seem slightly more irregular, but the forewing is by no means narrow or pointed as in *figuraria*, neither has the band the characteristic form of that species. STAUDINGER indicates as a further distinction from *intermedia*, that the basal part of the forewing is almost as strongly darkened as the band itself; the difference, however, is not very marked in the specimens before me. The dark base of the hindwing characterizes both. The egg is oval, truncate at the ends, with very irregular, angular longitudinal ribs, the depressions between them deep, crossed by smaller irregular ribs; greenish yellow. The larva, which HOMBERG reared from the egg on *Polygonum aviculare*, is short, thick, tapering in both directions from the 6th abdominal, strongly carinated laterally, segmental incisions well marked; the head is small, reddish brown; the skin is very rugose and granulated, deeply folded transversely; ground-colour dirty grey, washed with greenish yellow, paler from the 6th abdominal; dorsal line little paler, indistinct except at both ends, blackish edged, expanding into yellowish spots on the middle segments; some X-shaped markings at the incisions of the 2nd—5th abdominal; some elongate black lateral spots connected with the X-markings; lateral carina slightly pale; ventral region tinged with greenish, also rather paler, a medio-ventral line and on the 1st—5th abdominals some indistinct open lozenges. Pupa not elongate nor particularly glossy, greenish fulvous with abdomen reddish fulvous; cremaster with 8 hooks. Imago in June and September, Algeria and Tunis. According to STAUDINGER a form or closely allied species also occurs in Aragon and Andalusia.

Pt. rusticata Schiff. (4f) differs from the allies in the position of the dark band, which is placed *rusticata*. more distally, so that the discal spot stands about in its centre; the basal area is irregularly darkened, the dark colour being very obliquely edged, or almost confined to the costal half of the area; there is no separate postmedian line, probably the distal edge of the band represents it; the clouding proximally to the subterminal line is very variable in intensity, occasionally quite obsolete, leaving the entire distal area uniformly whitish. Hindwing without appreciable dark band, though sometimes the (rather narrow) area between the median and postmedian lines is slightly darker than the rest of the wing. Under surface similarly though less distinctly marked, the forewing more or less uniformly infuscated from the band to the base. ♂ antennal ciliation short and even. A singular problem presents itself in regard to the ♂ tibial armature. There exist two separate structural forms, which would have equal right with *asellaria* and *alyssumata* to be regarded as distinct species, but for an observation made many years ago by Dr. SPEYER, who was too careful a student of leg-structure to have been deceived in this matter. The form and length of the hindtibia is always the same, somewhat shorter than the femur, slightly thickening at its end and without hair-pencil; the difference consists in the presence or absence of the spurs. In general this is absolutely constant in particular localities, but SPEYER found remarkable variation in a series from Mayence, in part bred *ab ovo*; of captured specimens 2 had both spurs, 1 a single spur and 1 had none; of the bred, 2 had both spurs, 1 had none; the single spur in the 1-spurred example was shorter than the normal. The spurless form should be regarded as the type of *rusticata*, as this is the only form known from Vienna, whence the species was first described. Most of the specimens from Austria and Hungary and from some parts of Germany, so far as my information extends, belong here; so likewise one from Uralsk (coll. PÜNGELER) and the forms from Greece, Sicily and Spain. Those from Greece and Spain perhaps represent local races; according to STAUDINGER the former are of the reddish tone which he proposes, irrespective of spurring, to call var. *vulpinaria*. — *mustelata* Rbr. is *mustelata*. an aberration occurring in Spain, with the central band considerably reduced, occupying only the costal half of the central area; but perhaps the name can be extended so as to embrace all the Spanish forms, as a tendency towards reduction of markings is in general observable in them, even when not so far developed as in RAMBUR's figure and a specimen before me from Cuenca. — *vulpinaria* H.-Sch. is the correct name for *vulpinaria*. the two-spurred form, although it is oftener used (following STAUDINGER) for all the reddish examples. If it be really necessary to separate the reddish *vulpinaria* (as they occur commonly in Sardinia, Croatia and Dalmatia and in Asia Minor) from the dark, a new name will be required for the latter. Dark *vulpinaria* occur in S. England (where the spurless *rusticata* is entirely unknown), France, Holland, Kreuznach and the Rheingau, Valais, the Tyrol, Trieste and occasionally with the redder examples in Dalmatia. Exact information is still wanting from many localities. According to STAUDINGER the species extends to N. Africa and through Central Asia as far as Lake Issyk Kul. The larvae of the different forms have not been separated. The

accounts which I have consulted (MILLIÈRE, SNELLEN, RÖSSLER, BARRETT) were probably all drawn up from the form *vulpinaria*. The egg is very small, oval, apparently not described in detail. The larva is very sluggish. It is rugose, granulated, transversely folded, the lateral carination not strong; rather short, strongly tapering anteriorly; head very small, dark brown or blackish; body dull greyish brown; markings variable, sometimes only a fine pale dorsal line, sometimes also a more or less distinct lozenge-shaped dorsal pattern on the first 5 abdominal segments or even throughout; ventral area very pale greenish grey, with a whiter medioventral line and with subtriangular blackish markings on the 2nd—5th abdominals, their apices pointing forward. The pupa is of medium proportions, shining yellowish brown, becoming more reddish on the abdominal segments, especially towards the anus. The moth appears in June and July and a very partial second brood (at least in captivity) about October. In my experience as well as that of SNELLEN, the larvae which feed up rapidly yield moths of about the normal size, but those which hibernate can, if well fed, be made to produce veritable giants the following June. Polyphagous on withered or mouldy leaves.

robiginata.

Pt. robiginata Stgr. (= *rubiginaria* Fuchs) (5b). In its strongly ochreous colouring, yet not quite so intense or so reddish as in most *ochrata*, this species differs from all others with which I can compare it, unless possibly brightly coloured examples of *manicaria* or *fatimata* may be considered similar in ground-colour. The markings consist of a small dark discal dot on each wing and on the forewing 3, on the hindwing 2 fine wavy dark lines, finer and much less straight than in *aureolaria* Hbn. On the forewing they are about equidistant, the median just proximal to the discal dot, on the hindwing the median is well proximal, the postmedian very strongly bent, being almost angled at the first radial and markedly inbent between this and the third radial. In addition to the lines both wings usually show some weak, interrupted grey shading proximally to the subterminal and there is always an interrupted dark terminal line. Fringes dark grey, with a line of the ground-colour at their base. Beneath the lines are rather thicker and stronger, except the first line of the forewing, which is wanting; base of forewing dusted with grey but not very strongly. Locally common in Spain, flying in June and July in bushy places in the evening. Has recently been recorded from Belgium (Rochefort). The larva is thick, gradually tapering anteriorly, the lateral ridge very prominent, undulate and as it were festooned; head large, heart-shaped, rugose, blackish brown; body rugose, dark brown, the dorsal line paler, fine and continuous, subdorsal wanting, stigmatal line placed on the lateral ridge; a broad pale band traverses the ventral surface of the middle segments. MILLIÈRE says nothing as to the foodplants, but states that it shares the habits of the allies; it eats little during the winter and in captivity pupates in April.

lutulentaria.

Pt. lutulentaria Stgr. (3i as *lutulentata*). Near *fuscovenosa* in size, shape and markings, but unmistakable on account of its bright ochreous yellow ground-colour. Forewing with base of costa darkened as in *fuscovenosa*. Both wings with discal dot rather large and black. The lines are waved, the median of forewing preceding the discal dot, but not very strong. Distal margin and fringe unmarked. Under surface similarly but rather more weakly marked, basal area of forewing somewhat suffused, without first line. The egg is spheroidal, with one axis a little longer than the other; the surface is covered with hexagonal pitting, including an occasional irregular polygon of 5 or 7 sides. The larva is strongly rugose and granulated, moderately thick, tapering anteriorly and a little on the last 3 segments; setae black, clubbed; the colour is variable; head pale chestnut with darker dots; body of a more or less pale chestnut, vaguely marked with black at the incisions, the last 3 segments with a black mediodorsal line. MENDES reared it on withered or mouldy leaves of *Sarothamnus patenior*. It eats little and grows very slowly. The pupa is uniform yellowish brown. The moth is single brooded, appearing in June-July. Only known from some localities in Spain and Portugal.

dilutaria.

Pt. dilutaria Hbn. (= *stramentata* Ev.) (4f). Recognizable by its strongly silky gloss, the absence of the costal coloration which characterizes the preceding and the two following species (the costal margin has merely a sparse dusting of dark scales), the unmarked distal margin and fringe, etc. In the yellowish-tinted ground-colour, the minute size of the discal dots and the lack of terminal dots it is nearest to *humiliata*, but the red costal margin of the latter forms a constant distinction. The course of the lines is also nearer to that of *humiliata*, the pale subterminal not forming the projections which that of *fuscovenosa* shows. The lines are generally all of approximately equal expression, sometimes the postmedian a little stronger, sometimes the median of the forewing weak. The underside is similar, the postmedian line often a little stronger, the antemedian and sometimes the median of the forewing obsolete. ♂ antennal ciliation short and even, hindtibia not much thickened, tarsus as long as tibia. In the name-typical form, which is rather scarce, minute discal

praeustaria.

dots are present and the distal margins are slightly dark-shaded. — ab. **praeustaria** Lah. differs little from the type form, but shows a much stronger and broader fuscous border. It occurs in Dalmatia and S.E.

holosericata.

Hungary and even shows some tendency to form a local race. — ab. **holosericata** Dup. is probably the

commonest form and differs in wanting the discal dots and in being entirely without the dark marginal shading. Like *ab. praeustaria* it sometimes becomes a distinct race, as for instance in England. — *ab. subfasciata* *ab. nov.* has the median line on both wings approximated to the postmedian and the space between them occupied by a dark suffusion, forming a vague dark band. A bred example, in the PORRITT collection, is figured by Barrett (Lep. Brit. pl. 333, fig. 1). — The egg, according to TUTT, forms a somewhat flattened disc, scarcely longer than wide, the surface covered with raised points; probably a stronger magnification would show a cell-pattern as in *humiliata*; pale yellow at first, changing to orange. The larva is short and thick, tapering considerably anteriorly, carinated laterally, the skin exceedingly rugose, folded and granulated; segmental incisions strong; setae short and clubbed; head small and notched; the general coloration is dirty red-brown to blackish, the dorsal line paler, finely edged with black, especially on the posterior segments. It is extremely sluggish and usually grows slowly, feeding on withered or decaying leaves; it has even been observed to bite through the leaf-stalk as if to hasten the death of the leaf before eating it. It is said to be partial to *Helianthemum*, but is more or less polyphagous, like most of the genus. The moth flies in June and July; in captivity a second emergence can be obtained in September. Frequents grassy slopes and similar situations and is distributed in Southern and Southern Central Europe, Asia Minor and Armenia; STAUDINGER excepts Spain, but I have examples from Moncayo. *subfasciata.*

Pt. fuscovenosa Goeze (= *plebeia* Geoff. = *osseata* Haw. nec Hbn. = *interjectaria* Bdv. = *dilutaria* Led. *fuscovenosa*. nec Hbn.) (4f). Forewing slightly broader than in *dilutaria*, distal margin not quite so oblique. Ground-colour rather paler, at least in parts, not quite so uniform, basal part of costal margin more or less strongly infuscated; lines rather more irregular, especially the subterminal, which projects rather strongly basewards between radials and again near the posterior margin. Further distinguished by the comparatively large and sharply black discal dots and the presence of short black distal-marginal strokes and traces of dark dots on fringe. Egg oval, somewhat flattened at the ends, covered with a network of large regular cells; colour light red, becoming somewhat brighter after 2 days. Larva rather stout, gradually tapering anteriorly, segmental incisions not very deep, the usual lateral ridge present, the skin rugose and shagreened; setae very short, clubbed at the tip; ground-colour dirty, dull smoky brown, more or less marbled with ochreous or yellowish, especially the posterior segments, markings variable, usually rather strong; dorsal line ochreous, blackish-edged, especially on the posterior segments; three or four X-shaped dorsal markings on the junctions of the 1st—5th or 2nd—5th abdominals; ventral surface with a series of large ochreous crescentic marks. Feeds on low plants, especially on withered leaves, and grows slowly. POPE found that it would eat a moss, *Hylocomium triquetrum*, during the winter. Pupa light reddish brown, wing-cases greenish, incisions and cremaster dark. The moth hides by day in hedges or low bushes or grass and is of a quiet gentle flight. Locally abundant in June-July in Central and S. Europe, N. Africa, Asia Minor and Armenia. STAUDINGER in error writes "except England"; in the South of this country it is generally extremely common, and the mistake probably arose from the erroneous use of the name *osseata* for it by HAWORTH.

Pt. humiliata Hufn. (= *osseata* Schiff.) (4f) differs at once from all other known species in having *humiliata.* the costal margin of the forewing red throughout its entire length. This is not always equally bright, but it never fails; thus all but extremely worn specimens are quite readily distinguishable from *dilutaria*, which otherwise it rather closely resembles. The lines of the forewing, both in this species and the preceding, are frequently darker or more distinct at the costal extremity than in the rest of their course, which is not appreciably the case in *dilutaria*. A black discal dot is always present on the hindwing and nearly always on the forewing, but is often minute, sometimes extremely minute. Some strongly marked specimens show (at least anteriorly) an interrupted brownish or grey terminal line, but never the sharp black marks of *fuscovenosa*. The structure presents nothing very distinctive. The ♀ is on an average smaller and narrower-winged than the ♂, especially in the small British race; but this sexual distinction often in part characterizes the allies, and indeed a large proportion of the species of *Ptychopoda*. Except in size and in the brightness of the costal margin I have noticed little important variation; the under surface, especially of the forewing, is sometimes strongly powdered with dark scales, sometimes almost clear. All the lines seem to be always present, though in varying distinctness; the median of the forewing, which usually crosses or is closely approximated to the discal dot, is occasionally removed further basewards, approaching the first line; I have one example from the Val d'Herens in which they even coalesce throughout the greater part of their length, forming a single thick line with a small Y-shaped fork costally. Egg similar to that of *fuscovenosa* but with a slightly more greyish tint and the cells considerably smaller. Larva also similar to that species and with the same habits; VAN LEEUWEN, in his excellent life-histories in SEPP's "Nederlandsche Insecten", gives the following distinctions: head and legs black (in *fuscovenosa* brown); warts large (in *fuscovenosa* small), markings weak, pale-brown, not brown-black; 5th abdominal little lighter than the rest of the dorsal area; the X-shaped markings wanting. Pupa less greenish than that of *fuscovenosa* and with a dark dorsal line. The imago appears in June, or even, in sheltered localities, at the end of May, thus earlier in the summer than its nearest

relatives, and is fond of steep hill-sides; it neither reaches great altitudes, nor, so far as my information goes, the depths of the valleys. In suitable situations the most abundant of the group, but not extending far north; otherwise almost throughout Central and Southern Europe; N.W. Africa, Asia Minor and Transcaucasia

nitidata.

Pt. nitidata *H.-Sch.* (= *tectaria* *Leech*) (4f). Pale glossy straw-colour without discal dots or dots in fringe and with no dark dusting except a sprinkling of slightly deeper straw-colour or yellowish light-brown. The lines yellowish light-brown, all present (on forewing 5, on hindwing 4) though often more or less vague; strongly undulate, about equidistant, the median and postmedian of hindwing apparently the most variable, sometimes approximated, sometimes rather widely separate. Under surface rather paler and weaker-marked, especially of hindwing. ♂ antenna shortly and closely ciliated; hindtibia short, with rather strong hair-pencil, tarsus scarcely one-half as long as tibia. Differs from *dilutaria* in its much larger size, more uniform aspect (the lines generally yellower and weaker), lack of dark dusting at costal margin of forewing, etc. I can find not even the slightest varietal difference in *tectaria* *Leech*, from Chang Yang and Korea, to separate it from typical *nitidata*. It is observable that STAUDINGER also notes no difference for the Amurland and Ussuri specimens, which I have not seen. — **promiscuaria** *Leech*, not recognizable from the description, is an aberration (? sport) with the ground-colour almost white, the usually yellowish dusting greyer, the yellowish lines weak, but the median of the forewing thickened about the discocellulars so as to give some slight impression of a large discal spot. Fusan, Korea, ♀, taken in June. — The larva of *nitidata* is stout and compact, somewhat flattened, carinated laterally and tapering anteriorly, transversely folded; head small, bifid, red-brown; thoracic segments with ring-shaped protuberances, the first 5 abdominals with the segment-incisions deep, each broader anteriorly than posteriorly; ground-colour grey-brown, the middle segments with lozenge-shaped dorsal markings, divided by the black-edged dorsal line; dorsal line most distinct on the last few segments; before the lozenge-shaped marking stands on each segment two distinct black dots; 6th 7th and 8th abdominals lighter and more yellowish than the rest of the surface; lateral area also light; venter dark, with light longitudinal lines. Probably polyphagous on low plants; MAY reared it on lettuce. The moth appears in June and July and frequents warm sunny clearings in woods, resting among low bushes or grass; the ♀ is sluggish and less easily disturbed than the ♂. Inhabits N. Italy, S.E. Europe and Eastern Asia; the only intermediate locality indicated by STAUDINGER, and this only doubtfully, is Russian Transcaucasia.

*promiscu-
aria.*

bicertaria.

Pt. bicertaria *Stgr.* Only known from STAUDINGER's original description, founded on a single, somewhat defective ♀ from Tunis. Somewhat smaller than *nitidata*, light grey-yellow with sparse blackish dusting, both wings with sharp black discal dot and irregularly dentate dark postmedian line, forewing in addition with a weakly bent antemedian line; the dark shades which bound the subterminal are very faint and narrow. Thus the markings slightly recall those of the *circellata*-form of *straminata*, which is smaller and quite differently coloured. Under surface whitish grey with a little scattered dark dusting, the discal dots sharply black, the lines (except the antemedian) indicated but only extremely weakly.

degeneraria

Pt. degeneraria *Hbn.* (4f). This species and those which follow (as far as *aversata*) form a very natural group, being closely allied in structure, shape, facies and in the larval stage; they are in general among the largest *Ptychopoda* species. The typical form of *degeneraria*, however, is very easily recognized by the reddish brown band which occupies the area between the antemedian and the median line of the forewing and sometimes also extends as a more or less strong suffusion as far as the base. The hindwing also often shows a reddish suffusion from the median line (here proximal to the cell-spot) to the base. The postmedian line of the forewing is as a rule rather strongly elbowed or angled on the first radial, but is somewhat variable, as also in most of the group. Distinct, but usually small, black discal dots are present on both wings throughout the group. Shading distally to the postmedian line weak; terminal line slight, occasionally altogether absent; no dots in fringe. Under surface scarcely marked except for the discal dots; postmedian line sometimes indicated, and sometimes an obscure greyish basal suffusion to the forewing. ♂ antennal ciliation very short; hindtibia shortened and thickened, with strong hair-pencil, tarsus extremely short. Variable in colour, the variations being in part local and in part seasonal, so that a series collected at one time and place would generally give the impression of a rather constant species. The name-type, strictly speaking, is somewhat intermediate between the two former differentiated by MILLIÈRE, for such an intermediate form was figured by HÜBNER. But as the French author was the first to call attention to the dimorphism, it is best to follow his nomenclature, including as typical *degeneraria* those that agree with HÜBNER's figure and the darker (redder-tinged), dark-banded forms. — **meridiaria** *Mill.* was expressly erected for a form which, according to its author, is constant in Provence, with more yellowish or olivaceous ground-colour and light, redder band. He says further that the larva is so differently coloured that one might almost think of a separate species. In general, however this light *meridiaria* form seems to be associated with the second brood and in any case it is not so constant as MILLIÈRE thought; it may be due to the action of increased temperature on the adult larva, but I do not think this has been experimentally tested. FUCHS, in establishing the validity of his *bilinearia*, subjected some *degeneraria*-larvae to heat, and reports that

meridiaria.

this produced no approach to *bilinearia*, but does not say whether any change at all resulted; however, the Bornich specimens which I have seen already approach *meridiaria*. — ab. **depravata** Stgr. is more striking, *depravata*. on account of the entire absence of the characteristic dark band; even the lines are in general quite indistinct and the form almost unicolorous. It occurs in Southern Europe and Dalmatia. — ab. **floridaria** Püng. ab. *floridaria*. nov. (3k, as floridata) "Ground-colour deep rose-red, somewhat tinged with brown, dark median band, as in *depravata*, almost wanting, in single specimens of the autumn generation as distinct as in *degeneraria*. Bred in numbers through several generations together with *degeneraria* Hbn. as autumn form and ab. *depravata* Stgr. as summer form, yet without transitions to either, from eggs of a ♀ caught at Bastia, Corsica, end of May 1911, by P. PÜNGELER; also from Sardinia, GEO. C. KRÜGER 1911". PÜNGELER (i. l. 10th February 1912) adds some interesting detail which suggests the possibility that there is in this species some form of Mendelian inheritance, perhaps complicated by seasonal variation. The original ♀ was red. The offspring (end of July to mid August 1911) about half red and half *depravata*, no banded forms in either section. From these red *floridaria* there were bred in October–November about 25% *degeneraria* and no *depravata*, 75% being *floridaria*, a few only of these latter dark-banded. Herr PÜNGELER does not think it necessary to supply a separate name for the banded *floridaria* but proposes that in statistical work we should distinguish the two as *degeneraria-floridaria* and *depravata-floridaria*. I have an example of the former from Majorca, 1 June 1905. It should be added that typical *depravata* from Sicily, bred through several generations, has been known to remain true, like a Mendelian pure dominant or pure recessive, but a ♀ from the East Pyrenees produced a mixed brood of *degeneraria* and *depravata*. Larva moderately thick, gradually tapering anteriorly and with a rounded lateral ridge; skin rugose, strongly folded transversely; head small; body rather variable in colour, red-brown or blackish, the form *meridiaria*, according to MILLIÈRE, on an average lighter than the type; thoracic segments with red-brown dorsal spots; the first 4 or 5 abdominals with red-brown lozenge-shaped dorsal markings or at least with dark V-shaped marks indicating their posterior boundary; lateral line white, not sharply defined; ventral surface blackish, with pale spots on the middle segments. Pupa short and rather thick, moderately glossy, chestnut-brown, the anal segment and cremaster much darker. The moth is generally double-brooded, appearing in April–May and again from the end of July, frequenting warm hedges, etc. It is local in England, France, Germany and Austria, but more general in Southern Europe, N. Africa and from Asia Minor to Central Asia. — **erschoffi** Chr. (3i, as erschoffiaria) is probably nothing more than an *erschoffi*. Eastern local race of *degeneraria*. Except that the apex of the forewing is somewhat more acutely produced I can find no essential difference, and Herr PÜNGELER informs me that *degeneraria* from Transcaucasia and Central Asia in general incline in this direction. As an aberration, this wing-form may also be occasionally almost reproduced in Western specimens; thus I have one example from Philippeville, Algeria. CHRISTOPH's figure is redder, but this is not important. The only example before me, from Astrabad, is rather larger than average *degeneraria*, the discal dots rather large, almost as in *rubraria*, the coloration and markings almost entirely as in normal *degeneraria*; the first and median lines are a good deal darker and less reddish than the band which they enclose, and a dark shadowy band distally to postmedian line is rather better developed than in most *degeneraria*. The form *erschoffi* is recorded from Transcaucasia, Persia and Transcaspia.

Pt. rubraria Stgr. (4g). Confusingly near the non-banded forms of *degeneraria* (*depravata* and *floridaria*). Both STAUDINGER and FUCHS originally regarded it as a mere form of that species, but FUCHS in 1886 announced its specific distinctness and later, in a very long article (Jahrb. Nassau. Ver. Nat. vol. 42, p. 211–218), worked out the question more fully. In STAUDINGER's latest edition it is called a Darwinian species. On an average somewhat larger and more robust than *degeneraria*, without any tinge of greenish, the discal dots larger, the postmedian line finer and sharper, in general more acutely angled on the first radial and usually somewhat more incurved posteriorly, well developed also on the under surface; the median shade is present on the upper surface, but never very strong, never widened into a band but consisting only of a vague thick line, which is placed on the forewing close distally to the discal dot and on the hindwing proximally to it. The ♂ antennal joints project appreciably more than in *degeneraria*. In the name-type the ground-colour is reddish all over, the median shade slightly darker. — ab. **bilinenaria** Fuchs is considerably *bilinenaria*. paler, ochreous with hardly any red tinge but with the median shade decidedly reddish. In the Rheingau, and perhaps in most localities, it is the common or form, the biological "type". Whether, as was at first conjectured, the form *rubraria* really occurs more frequently in the ♀ sex than in the ♂ now appears very doubtful. — f. **therinaria** F. Fuchs is a smaller, finely scaled, almost unmarked form, very rare in a state of *therinaria*. nature but frequently obtained by breeding, representing a second generation. — The larva looks at first glance quite different from that of *degeneraria*, but this is chiefly on account of a strong darkening of the ground-colour, or at least a strong dark admixture, in the anterior two-thirds, excepting the head. Body much flattened, thick in the middle, tapering anteriorly, lateral ridge strongly protuberant, constricted at the segment-incisions; venter more rounded; ground-colour grey or yellowish grey, anterior two-thirds dorsally darkened to brown or even black-brown; a double medio-dorsal line, scarcely discernible except on the paler part, accompanied by indistinct oblique streaks running out anteriorly; ventral area brown, with

large light trapezoidal spots in the middle. Full-fed from the middle of June onwards. Pupa shaped like that of *degeneraria*, but more strongly built and sometimes more reddish. The moth, according to FUCHS, does not appear till July-August, thus much later than the first generation of *degeneraria*, and is only single-brooded in a state of nature, at least in his district and in normal seasons. But in captivity, as with many species of *Ptychopoda*, an additional brood can be obtained about October. It is to be observed further that RÖSSLER's account of the life-history of *degeneraria* refers not to that species but to *rubraria*. It may also be mentioned that WENDLANDT has recently disputed the identity of *bilineararia* with *rubraria*, but gives no grounds for his view; he records a strikingly small, absolutely fresh example captured on 28th August, which he regards as representing the otherwise unknown second brood in a state of nature. The geographical range of *rubraria* embraces a part of Central Germany, Lower-Austria, the Southern Tyrol, Hungary, Capri, Sicily, Dalmatia and Greece.

inornata.

Pt. inornata Haw. (= *suffusata* Tr.) (4g). This species and the following present another rather puzzling assemblage of very closely similar forms, some of which still need more exact investigation. True *inornata*, which is appropriately named, may best be recognized by its strongly glossy, quite weakly-marked wings, entirely without dots at base of fringe and often entirely without dark marginal line, which in any case is not very strong. The postmedian line of the forewing, which in most of the allies is angled or strongly bent on the first radial, here shows no appreciable bend, or at the utmost an extremely blunt one. This affords a convenient distinction from weakly-marked *aversata* ab. *remutata* and from *degeneraria* ab. *depravata*, but unfortunately not from the still more closely related *deversaria*. Underside somewhat paler, somewhat less glossy, occasionally with some minute scattered dark atoms; postmedian line and interrupted marginal line rather better expressed than above; forewing usually with a slight brownish suffusion in the cell and costally. So far as I can see the sexes do not differ materially; according to GUENÉE the ♀ has the interrupted terminal dark line on the forewing above better developed than in the ♂, and I think this is the general tendency, though neither very pronounced nor constant. Not a variable species on the whole, though there is some variation in the shade of the ground-colour and the position of the lines. Bred specimens show a slight olivaceous gloss, which is to a large extent lost after the species has been on the wing a short time. — ab. **agrostemmata** Guen. founded on two bred specimens, was erected as a separate species, but is a quite unimportant aberration, its small size perhaps due to breeding. Apart from size, however, it differs in being still more weakly marked, the lines scarcely traceable. The larvae were found in Central France, feeding in the capsules of *Agrostemma dioica*. — ab. **amoenata** Fuchs (= *suaveolaria* Fuchs), described from Sicily, is distinguished by its more reddish tone, especially towards the distal margin and the fringes. I have not seen an extreme form, but some British examples approach it. — The egg of *inornata* has been described and figured by PEYRON, and figured by SOUTH; it is oval, with the usual small concavities 5- to 7-sided; whitish yellow at first, becoming blotched with red. Laid, according to SOUTH, in strings of from 6—20. The larva is very similar to that of *degeneraria*; rather thick, tapering gradually anteriorly, carinated laterally, skin strongly rugose, subsegmentation well marked; head small, rough, horn-colour with two whitish posterior spots; body varied with different shades of grey and brown, or somewhat more reddish; 1st—5th abdominals with dark dorsal V-marks, their apices at the posterior extremity of the segments; sometimes with pale spots on the dorsum of the 4th and 5th abdominals. Polyphagous on low plants and rather easy to rear; a large percentage of the larvae can generally be induced to feed up rapidly and yield a second brood of moths about September. Pupa yellow-brown, darker at anal extremity; cremaster with the usual 6 curved spines. The imago flies in May, June and July and into the beginning of August (in southern localities partly double-brooded) and inhabits heathy or bushy places or woodland, hiding in the herbage or resting with wings outspread on tree-trunks or fences. At night it may sometimes be attracted by "sugar". Widely distributed almost throughout Europe except the extreme north, generally common, though less abundant and more local than *aversata*; reported scarce in many parts of Eastern Europe and not yet known from Asia.

*agrostem-
mata*.

amoenata.

deversaria.

Pt. deversaria H.-Sch. (= ? *spataceata* Scop. = *subversaria* Loh. = *suffusata* Guen. nec Tr.) (4g) has been regarded by some authors as a form of the preceding, but is now acknowledged to be distinct, or at the least a "Darwinian species". Slightly less glossy, more yellowish, with no olivaceous tinge; the lines better expressed and sometimes thicker, the median shade usually distinct and thick, the shades on either side of the subterminal line generally better developed; marginal line sometimes better developed, a distinct series of small dots usually present at base of fringes. Under surface with median shade usually well developed, as well as postmedian line. The course of the postmedian line of the forewing is often not or scarcely distinguishable from that of *inornata*, but its tendency is to be intermediate towards that of *aversata*; that is to say, it is often appreciably bent on the first radial, though not sharply angled. — ab. **maritimata** Guen., erected as a form of *inornata*, is distinguished, according to REBEL, by having the median shade more strongly developed than in typical *deversaria*. GUENÉE does not directly compare it with *deversaria* (his *inornata* var. *suffusata*) but emphasizes the strong expression of the median shade. W. coast of France. —

maritimata.

diffuata.

In ab. **diffuata** H.-Sch. (3k, 4g) the entire space between the postmedian and subterminal line on both

wings is filled up with a dark band, or at most there is only a fine line of the ground-colour between the postmedian line and the band. Distally to the subterminal there is also as a rule stronger dark shading than in the type form, but it is generally rather weak, seldom so strong as in the example figured on Pl. 3k. *diffuata* is the prevailing, though not the only form in S.E. Hungary and occurs also in Dalmatia, Bosnia, Asia Minor and perhaps Bohemia. The examples which I have seen from Asia Minor have also the basal area of the forewing darkened. A. FUCHS and F. FUCHS both maintained that *diffuata* was a separate species, but seem to have studied very little material, and bring forward no better arguments than that it is brighter yellow, far less sprinkled with black but more strongly black-marked at the distal margins and fringes. Even at Herculesbad, one of the best-known localities for *diffuata*, non-banded *deversaria* still occurs together with the aberration. Regarding the name *diffuata*, which its author adopted from MANN's manuscript, it is not quite certain that it was originally intended to apply to this form; in the ZELLER collection examples of *nitidata* are labelled *diffuata* MANN, and as HERRICH-SCHÄFFER figured from Mehadia and on the same plate both *nitidata* and the present form it is not impossible that by some error he misapplied MANN's name. — ab. **laureata** Fuchs (3k), from the Rheingau, is very similar to *diffuata*, but easily distinguished by the alternate bands of light and dark colour in the distal area; that is to say, only the distal half of the space between the postmedian and the subterminal is darkened; the area distally to the subterminal is (at least in my examples) fully as dark as the area proximally to it. Recorded also from S. Tyrol, Bohemia, etc. — ab. **habichi** Schawerda is a melanotic form, strongly suffused with smoke-colour yet with the 3 black lines remaining distinct both above and beneath. Bosnia. — ab. **hyalinata** Chr., which possibly forms a local race in Transcaucasia, scarcely differs from *deversaria* except in having the median shade (inner line) of the hindwing removed further proximally from the discal dot. Described from several examples taken at light in May and August. The larva agrees in form with those of the allied species and shows scarcely any constant difference from that of *inornata*. According to FUCHS, who bred the two side by side, it is on an average lighter, but it varies somewhat in colour and that of *inornata* varies considerably. The only constant difference which he could find consisted in the presence of a white dot in the apices of the V-shaped (at times Y-shaped) markings in *inornata*, which is nearly always wanting in *deversaria*. Pale grey-yellow, or more rarely yellow-brown, the dorsal pattern varying in distinctness. Pupa apparently not yet differentiated from that of *inornata*. The moth flies in June and July, appearing a week or two earlier than *inornata*. Its range is not so extended northward nor perhaps westward as that of the preceding species, though in many Central and S.E. European localities they occur together; *deversaria*, on the other hand, extends also to Asia Minor, Transcaucasia, Transcaspia and other localities in Western Asia. I consider it highly probable that this is the *spatuceata* of SCOPOLI, described from Carniola; at least there seems to be no other species to which his description and (miserably bad) figure can be applied; but as WERNEBURG determined it for *remutaria* Hbn. (*floslactata* Haw.) I have left the name in abeyance.

Pt. aversata L. (= *grisata* F. = *latifasciaria* Hdnr.) (4g). Cannot possibly be confounded, in its typical form, with either of the allies, the dark band being here placed between the median and postmedian lines, while in *degeneraria* it is placed between the antemedian and median and is the aberrations of *deversaria* distally to the postmedian. In general, also, *aversata* is rather less glossy than the allies, more strongly dusted, the postmedian line rather sharply expressed, more strongly angled on the first radial of the forewing than in *deversaria*, the distal marginal line and dots at base of fringes always present, mostly very conspicuous; the area distally to the postmedian line is generally very weakly marked or quite without markings, but occasionally (especially in the banded forms) a moderately conspicuous dark shade is developed proximally to the subterminal. Only a few weakly-marked glossy aberrations, and particularly when the angle in the postmedian line happens to be less pronounced than usual, are confusingly like *inornata*. As these weakly-marked specimens have usually hardly any subterminal dark shading they are in general less likely to be mistaken for *deversaria*, but great care is needed in individual cases. *Pt. aversata* shows a wide range of variation, and several of the forms have received separate names. Even LINNÉ and CLERCK knew no less than three, which they assumed to be separate species. This has resulted in some confusion in the synonymy, as later authors attempted to identify the second and third forms with other species of *Ptychopoda*, or even of *Acidalia*. The true *aversata*, as here figured, is by no means a rare form, but is not nearly so abundant as the ab. *remutata*. — ab. **lividata** Cl. differs little from typical *aversata* and would scarcely need to be separately described but for the confusion which has prevailed regarding its identity. The median shade is placed rather further from the discal dot than in some forms, the dark space which extends from the median to the postmedian consequently a little narrowed; but on the other hand there is an additional pronounced dark shade proximally to the subterminal line and even a little (narrow) dark shading distally thereto. In most copies of CLERCK's "Icones" the figure of *lividata* is very badly coloured and quite unrecognizable, in consequence of which those systematists who have seen only such copies have made very faulty attempts at its determination. Thus LASPEYRES considered it to represent *dimidiata* and *biselata* (which he regarded as forms of a single species), WERNEBURG selected *biselata* and ZELLER thought it nearer to *deversaria* than to anything else. On the other hand ILLIGER, STEPHENS and GUENÉE, who presumably had access to better copies

- of the book, gave the right determination. In a beautiful copy in the WALSINGHAM Museum (recently presented to the British Museum) it is absolutely unmistakable and is as here described. — ab. **remutata** L. (= ? concatenata Hufn. = trilineata Hufn. = murinata F. nec Scop. = aversata Guen. = spoliata Stgr., (4g): This very abundant form differs the type in the entire absence of the dark band between the median and postmedian lines. GUENÉE considers this form "naturally" the type of the species, ignoring LINNÉ's description; at the same time, unlike most other observers, he finds the true *aversata* form (which he calls var. *lividata*) "as common" as this. Normally ab. *remutata* has the same ground-colour as typical *aversata*, but sometimes, as in the example which we figure, it is more or less yellowish in tone, approaching the colour of ab. *fuliginata*.
- fuliginata*. *aurata*. — ab. **fuliginata** Haw. may perhaps be, as GUENÉE indicates, a form with the ground-colour darkened, yet with the band still appreciably darker; but it is not well described and the type specimen appears to be lost, while a specimen labelled *fuliginata* by STEPHENS in the British Museum collection does not agree with the description. — ab. **effuscata** Galvagni is a further development of ab. *lividata*, with the dark colour extended over the entire marginal area of both wings. — ab. **atrata** F. Fuchs (= suffumata Lambill.) is the most extreme development, the entire surface of both wings being covered with blackish atoms, the lines still darker. It was described by FUCHS from Lorch-am-Rhein, and by LAMBILLION from Dinant, but I have seen some fine examples in our London collections and there is some reason to believe that, like so many melanotic forms, it is here becoming commoner. In very extreme cases the melanism becomes perfect, the wings being of a uniform glossy blackish. — ab. **aurata** Fuchs has the ground-colour bright clay-yellow, usually (at least in the specimens which I have seen) with a slight reddish tinge. The band is commonly present, but FUCHS also includes non-banded forms. None of the above-described aberrations shows any marked tendency to form a local race, and often three or four of them may be obtained in the offspring of a single ♀. The early stages of *aversata* have long been well known, and were described in the works of SCHWARZ, SEPP and other old authors. The egg is similar to that of *inornata*, the concavities not deep; pale reddish yellow, becoming darker and irregularly marked with red. Larva moderately stout, tapering anteriorly, somewhat flattened, with a projecting and puckered lateral ridge; head small (but, according to a side-by-side comparison by HEYLAERTS, less small than that of *inornata*), reddish brown thickly dusted with black; body rugose, skin transversely folded, dull brown, posterior four segments paler, tinged with ochreous; dorsal line whitish, indistinct, on the thorax and last four abdominals with a dark bordering, on the intermediate segments accompanied by brown V-shaped markings, the arms of the V more widely separated than in *inornata*; one or two white dorsal spots; subdorsal line indistinct; lateral line whitish ochreous; underside dark, with a blunt pale wedge-shaped blotch on each segment, containing two brown lines, and followed by a smaller one in which is a grey V. Polyphagous on low plants. During the winter it hibernates very completely, even when kept in a warm room; and it has been observed to maintain its vitality for some months when kept entirely without food. Pupa smooth but not glossy, rather blunt anteriorly; pale reddish brown, darker dorsally and at the segmental incisions, wings greenish, cremaster dark brown. The moth is found pretty continuously from June to September, having a rather protracted period of emergence, while a few larvae of the offspring of the early moths feed up rapidly, producing a partial second brood. Common almost throughout Europe with the exception of the extreme north and of some parts of Spain and Portugal; also occurs in Asia Minor, Syria and Armenia.
- emarginata*. **Pt. emarginata** L. (= erosata Hufn. = demandata F. = marginata F. = rumigerata Don. = quadri-punctata Don. = dimidiata Haw.) (4g). A very distinct species in shape, forming in this respect a separate section of the genus; some systematists, indeed, have accorded to it generic rank under the name of *Ania Steph.* In all other respects, however, it seems to be a normal *Ptychopoda*. Forewing with the distal margin somewhat excavated between the apex and the 3rd radial, prominent at the 3rd radial and 1st median; hindwing similar, the excavation being between the radials. Pale yellowish-brown or reddish-ochreous, variable in depth of colouring; the lines darker red-brown, the inner wanting on the hindwing; both wings usually also with a diffuse median shade, in the ♂ as a rule faint, in the ♀ strong and broad; both wings usually with distinct discal dot and dark marginal line. The ♀ further differs from the ♂ in being generally smaller-winged but with a much more robust body, and in having the wings still more strongly emarginate than the ♂.
- mosquensis*. ♂. — ab. **mosquensis** Heyne has both wings more strongly powdered with black scales, giving it a much darker appearance, the median band strong, dark grey or blackish; fringes also darkened. Founded on several examples from Moscow. Unfortunately it is not stated whether it is confined to the ♀, in which it would be scarcely striking. — The egg of *emarginata* is a somewhat irregular oval, the surface covered with a regular hexagonal reticulation; very pale reddish-brown, becoming darker in the centre and round the edge as its development proceeds. The larva is rather stout, gradually tapering anteriorly; rugose, transversely ribbed, the ribs less distinct on the anterior portions of the middle segments; head notched, dark brown; body somewhat variable in colour, dull ochreous to olive brown; a pale mediodorsal line, finely dark-edged especially on abdomen, where the edging thickens into broad dark marks, tending to become continuous on the last 4 segments; middle segments with dark V-shaped markings, their points directed caudad, sometimes also with V-shaped markings pointing cephalad, the resultant pattern being a series of X-marks at the

incisions; ventral surface almost uniform olive-brown. Feeds on various low plants, possibly with a preference for *Convolvulus*, to the curved withered stems of which it bears a close resemblance; fresh or withered leaves seem to be equally acceptable. Pupa smooth and shining, reddish yellow with greenish wings; the pupal stage is of short duration. On the wing in June, July and August, and in captivity a partial second brood may be obtained. Sluggish by day and not so easily disturbed as many of the species; flies at late dusk and after dark and is strongly attracted by light. Europe and the Altai, widely distributed but rarely very abundant, inhabiting chiefly damp places where there are hedges or bushes, the borders of damp woods, etc.

The following recently-described species are unknown to me and little or no clue is given as to their systematic position, but they will no doubt — with the possible exception of the last — be found to belong to *Ptychopoda*.

Pt. euphorbiata *Balestre* (as *Acidalia*). "Expanse about 20 mm. ♂. Wings dull yellowish sprinkled *euphorbiata*. with some black atoms. Forewing traversed by two black lines: the extrabasal, more black at the costa, forms a rounded bend towards the discal dot, which is hardly marked; the postmedian, blacker at the costa and at the inner margin, forms an acute angle distally opposite the discal dot; subterminal hardly marked by a slight shade. Hindwing with two undulate lines continuing those of the forewing, the subterminal shade and a discal dot well marked. Fringe lighter, preceded by a series of small black dots. Under surface shining pale yellow, strongly irrorated with black atoms, with the postmedian line alone visible, better marked in black than above; discal dots hardly visible. ♀ similar. Near Nice: Mount Pacanaglia. Larva short, attenuated anteriorly, rugose, carinated, uniformly black. It lives on *Euphorbia spinosa*, hibernates, and pupates in May. Emerges in July".

Pt. oberthuriata *Balestre* (as *Acidalia*). "Expanse about 10 mm. ♂. Bone-colour speckled with black *oberthuriata*. atoms. Forewing with the ordinary lines, rather well marked, and a thicker and darker median shade; all these lines formed by condensation of the black atoms. The extrabasal nearly vertical, forming a rounded bend at the costa. The postmedian makes a similar rounded bend opposite to the discal dot, which is hardly visible, sometimes wanting; median shade nearly straight. Hindwing with the same lines and a discal dot, always better marked than on the forewing. Fringe of both wings long, concolorous with the wings, preceded by a series of small black dots. ♀ similar, but with the wings always more copiously black-speckled. Near Nice: Mount Pacanaglia. Larva short, folded, rugose, carinated, of a light burnt brown dotted with black. Head reddish with the hairs small and nearly colourless. Lateral line fine, dirty yellow, hardly visible. Dorsally three lunulate markings are observable, their points directed caudad. It lives in the detritus which is found under *Euphorbia spinosa* and eats the withered leaves of this plant. It hibernates, pupating in July. The perfect insect emerges in August. The smallest species of the genus, dedicated to M. CHARLES OBERTHÜR".

Pt. coulioniata *Balestre* (as *Acidalia*). "Expanse about 12 mm. ♂. Wings vinous bone-yellow, glossy. *coulioniata*. Forewing traversed by two black lines, widely separated: the extrabasal, strongly marked at the costa, is slightly rounded; from the median vein to the inner margin, it is accompanied by a thick black mark, rectangular in form, situate in the median area; postmedian arising from a strong black costal mark, of about 1 mm, then forming a slight elbow distally, afterwards proceeding in an almost straight line to the inner margin; discal dot wanting. Hindwing with two lines continuing those of the forewing: the extrabasal thick, diffuse, formed of numerous blackish atoms; postmedian fine and slightly undulate; discal dot black, distinct. Fringes concolorous with wings, preceded by a series of small black dots. Under surface pale shining yellow, unmarked, the forewing having merely a black mark on the costa; discal dots very small, visible on both wings. ♀ similar, but with the markings less dark. Near Mentone: Annonciata Hill. Larva light earth-brown, rugose, folded transversely, carinated, with the small hairs light-coloured especially at their extremity. Head rather large, dirty yellow, speckled with brown. Dorsal line fine, very light dull yellow, hardly distinct, in some specimens very finely bordered with blackish, crossed by three rather distinct dirty yellow spots. On the 5th abdominal there is a black V-shaped mark, the point directed cephalad and followed by two black dots on each side of the dorsal line. It lives on cypress, hibernates, and pupates at the beginning of June. The perfect insect emerges at the end of June. Dedicated to Dr. COULON (of Monaco)".

Pt. nigrolineata *Chrét.* (as ? *Acidalia*). "Expanse 10 mm. Forewing prolonged and rounded at the *nigrolineata*. apex; distal margin oblique, nearly straight; posterior angle a little prominent, sharp; yellowish white, slightly ochraceous, sprinkled with blackish brown scales; costa yellowish brown; lines rather thick, black: the first commencing at the costa at $\frac{1}{3}$, forming a pronounced angle in the disc, descending almost perpendicularly on the inner margin; the second, commencing a little beyond $\frac{2}{3}$, forms an acute angle at the 3rd radial and 1st median, is retracted behind the median and descends almost perpendicularly on the inner margin, which it reaches at little beyond $\frac{2}{3}$; the median shade, arising from a large costal spot, nearly at mid costa, approaches the second line, joining it on the 2nd median; subterminal line light, between brown shades;

discal dot hardly distinct in the median shade; distal marginal line fine, continuous, black, thickened at the posterior angle; fringe whitish, chequered with black. Hindwing similar, without first line; second line very oblique at first and fine as far as the 2nd subcostal, on which it forms a very acute angle, then broad and thick; distal margin rather deeply sinuate, especially near the inner angle, which is acute and prominent; shape of the wing recalling that of *intermedia* Stgr. Under surface greyish at the base of the wings, paler towards the distal margin, with the median shade and second line of the upper surface rather distinct. Head and thorax concolorous with wings; vertex yellowish brown; antenna brown, finely ciliated; palpus brown; abdomen yellowish, with black scales at the extremity of the segments; legs yellowish ochraceous, the posterior a little shorter. It does not appear certain that this very characteristic new species is a true *Acidalia*, although it approaches that genus in having the 2nd subcostal and 1st radial of the hindwing stalked. The knowledge of both sexes will no doubt permit our being more definite. Flies in June, at Gafsa. The above description suggests a possible relative (or even a small light form) of *figuraria* Bang-Haas, which also I do not know in nature. Neither the sex nor the hindtibial armature is indicated.

balestraria.

Pt. balestraria D. Luc. (as *Acidalia*) "Forewing rather elongate, in both sexes yellowish-white above with a very distinct black discal dot; fringe slightly darkened; between the discal dot and the fringe, and nearer to the former, there is a very fine yellowish line, parallel with the distal margin, anteriorly with an obtuse angle, pointing distad; parallel to this, a sinuous line formed of brown patches of equal breadth; finally, touching the fringe, a rather distinct brown line, thickened at the apex; a line parallel to the distal margin passes close to the discal dot and forms at this point a right-angle; between the thorax and this line there is a very fine brown one, parallel to it; basal area slightly shaded with brown. Hindwing concolorous, with similar lines, continuing those of the forewing, those between the discal dot and the fringe sharply defined. Wings beneath lighter, markings a little less distinct. Thorax, head and abdomen yellowish white. Vertex white. Antenna filiform, yellowish. Legs of the same colour. Palpus very short. Tongue rather short, yellowish". Described from several of both sexes taken at Tozeur, Tunis, in June 1907.

21. Genus: **Limeria** Stgr.

Palpus very small. Tongue apparently wanting. Antenna in ♂ with fascicles of long cilia. Hindtibia in ♂ without spurs, in ♀ with slender, not very well developed terminal spurs; tarsus not aborted. Forewing in ♂ very narrow and pointed, in ♀ still narrower, almost lanceolate; cell long, neuration otherwise as in *Ptychopoda*. Hindwing very narrow, the distal margin sinuate, about as in the narrowest-winged *Ptychopoda*; costal vein touching subcostal at a point near the base, continuing approximated for some distance; 2nd subcostal stalked with 1st radial.

An evident offshoot of *Ptychopoda*, differing in scarcely anything except the extreme shape and the apparent absence of the tongue; it is strange that STAUDINGER entirely failed to recognize its very evident affinities and associated it with *Egea* and the genus which he calls *Acalia* (*Ithysia* Hbn.). I have only been able to examine a single pair, ZELLER's originals mentioned by STAUDINGER.

The sole known species inhabits a restricted area north of the Caspian Sea.

macraria.

L. macraria Stgr. (3b, ♂). Greyish sand-colour, dusted with dark atoms, the hindwing rather paler. Forewing with blackish discal dot and dark postmedian line, the latter placed rather near the distal margin, running slightly obliquely from the posterior margin in the direction of the apex, but acutely angled after crossing the first radial; a rather more diffuse line usually follows the postmedian, from the posterior margin to the first radial, and the narrow area between the latter line and the distal margin is whitish. The hindwing is similarly or more weakly marked. Under surface similar, slightly more brightly coloured and sharply marked, the hindwing not paler than the forewing. Sarepta and the Ural.

The **Cosymbia**-group.

22. Genus: **Cinglis** Guen.

Palpus moderately long, rough-scaled beneath. ♂ antenna with long fascicles of cilia, arising from short pectinations. Hindtibia slender, in ♂ with 2, in ♀ with 4 spurs. Forewing with areole simple; 5th subcostal arising below (behind) its apex, 1st to 4th subcostals long-stalked. Hindwing with 2nd subcostal and 1st median very shortly stalked, perhaps sometimes arising from a point at apex of cell, discocellars oblique, 1st median arising separate from 3rd radial.

In aspect a somewhat isolated genus and consisting only of a single species, belonging chiefly to Southern Siberia; a few other species have been referred here by HULST and WARREN, but erroneously.

Notwithstanding its very different appearance, it shows but little structural deviation from *Cosymbia*, the chief differences being in the ♂ antenna and in the somewhat stouter, more thickly-scaled palpus. Whether this close structural resemblance is entirely due to close affinity, or in part to convergence, can only be decided by the discovery of the early stages or of some important characters which have hitherto escaped the observation of systematists.

C. humifusaria Ev. (4a). White, glossy, the veins broadly (the 2nd radial more narrowly) marked with brown; costal margin of forewing densely dusted with brown; lines brown, the postmedian somewhat the darkest; antemedian bent outwards on the median vein; median rather broader, somewhat curved, closely following the large, roundish cell-mark; postmedian outcurved between the 3rd radial and the 2nd median closely followed by a brown band; distal area with the brown vein-markings still further thickened, sometimes leaving between them only quite narrow white wedge shaped markings; fringe chequered with brown and white. Hindwing without first line. Underside similar, less glossy, without first line. Occurs from SE. Russia and Transcaucasia to the Ili district, also in S. Spain and N. Africa. Said by EVERSMAAN to fly by day, end of May and beginning of June; in Murcia KORB took it over *Artemisia*. Dr. SEITZ denies the day flight; he tells me the species is not rare near Batna and sits among the bushes of *Artemisia herba alba*, flying off when disturbed, like other Geometridae. *humifusaria.*

23. Genus: **Cosymbia** Hbn.

Palpus rather short to moderate, shortly rough-scaled, terminal joint distinct, slender, smooth. ♂ antenna bipectinate with moderately long branches, apical part simple. Hindtibia in ♂ with 2, in ♀ with 4 spurs. Forewing with areole simple, 1st subcostal separating from 2nd to 4th considerably after 5th. Hindwing with 2nd subcostal connate or sometimes very shortly stalked with 1st radial, discocellulars not oblique, 1st median arising close to posterior angle of cell or not infrequently even very shortly stalked.

Egg longish oval, the surface covered with an irregular network of raised ribs. Larva moderately elongate, nearly cylindrical, very slightly thickened posteriorly, head rather large, slightly bifid, body without marked protuberances; on various trees, not hibernating. Pupa exposed, attached to a leaf, with cremastral pad and central girth and showing several other remarkable resemblances to a *Papilio* pupa.

An extremely natural genus in its structure and entire life-history. Even in shape the species agree well. They are partially double-brooded and several exhibit marked seasonal dimorphism; the winter is always passed in the pupal stage. The moths rest by day on tree-trunks, or more commonly among leaves and are in general easily obtained in the day-time by searching, or by beating the bushes or trees in which they hide. At dusk they are in general less observed than many other Geometrids, but later at night they may sometimes be captured at sugar or attracted to a strong light. By far the best way of securing a number, however, is by breeding. The ♀♀ lay very willingly in captivity and the larvae are easy to feed up. Moreover on account of their tree-frequenting habit they are unlike those of the preceding genera quite easily obtained by beating.

A very interesting and well established fact regarding the earlier stages is that the colour-dimorphism which nearly all the known species of the larvae exhibit (green or brown) is always carried through to the pupal stage. Not less interesting is the remarkable convergence, in the pupal structure and method of suspension, towards certain other exposed pupae particularly of butterflies and Elachistids. So far as I know this phenomenon has only been observed in two other cases among the rest of the Geometrid subfamilies — the North American *Euphanessa* Pack. (subfam. *Larentiinae*) and the Australian *Terpna percomptaria* Guen. (subfam. *Hemitheinae*) — but in the *Cosymbia*-group it seems pretty constant (*Anisodes*, *Pleuroprucha*, etc.). It is said, however, that *annulata* often pupates among moss.

The perfect insects also invite careful study, not only on account of their beauty and general variability, but also on account of their adaptability to scientific investigations of the effects of temperature and in hybridization. The accounts of the separate species must be consulted for detailed information on these matters.

The genus is not extensive, and is almost, if not entirely, confined to the Palearctic Region (chiefly its western part), Africa (2 or 3 species) and America (a few species). In the great Indo-Australian Region and to a very large extent in South America it is supplanted by some specialized offshoots — *Anisodes* and its allies. "Ceylon", given by WALKER as the locality for his *vusarmana*, is evidently a mistake, as already pointed out by HAMPSON; his type-specimen is a typical *pendularia* Cl. and this is, in its range, the most northern species of *Cosymbia*. The genus has been called by many names (*Cyclophora*, *Codonia*, *Leucophthalmia*, *Ephyra*, *Zonosoma*, etc.) but *Cosymbia*, as used by WARREN, DYAR and SWINHOE, is clearly correct; this was erected by HÜBNER for *nolaria* Hbn. (= *pupillaria* Hbn. ab.)

The genitalia of the European species have been carefully investigated by BASTELBERGER and indicate two distinct groups: (1) *pendularia*, *orbicularia*, *albiocellaria*, *annulata*, *pupillaria*, *quercimontaria* and *ruficiliaria*, with forceps wanting or rudimentary: (2) *porata*, *punctaria*, *linearia* and *suppunctaria*, with forceps powerfully developed.

- pendularia*. **C. pendularia** Cl. (= *albipunctata* Hufn. = *suspensa* Retz. = *pupillaria* Brahm = *circularia* F. = *vusarmana* Walk.) (4n). Whitish, dusted with grey atoms and usually with some slight reddish suffusion in the median area of the forewing, especially round the discal dot and on the median shade when the latter is present. Forewing with distal margin rather straight; the two lines represented chiefly by black dots or minute dashes on the veins, the antemedian usually preceded and the postmedian followed by a narrow pale space, or thick line; median shade thick, curved, sometimes strong, sometimes weak or wanting; a distinct white, dark-ringed discal ocellus; distal margin with black dots. Hindwing with the same markings, but with the reddish suffusion weaker, often absent. Under surface entirely without reddish suffusion, the forewing somewhat or considerably more strongly dusted with dark grey in basal half, both wings with first line wanting, ocelli wanting or quite weak, postmedian line well developed. A very variable species, which has received much attention from aberration-makers. English specimens are generally darker than continental, approaching ab. *griseolata*. — ab. **griseolata** Stgr. (4n) is one of the most important forms because it has assumed, more than most of the others, a decided tendency to form a local race. It is more strongly and uniformly dusted with grey than the type, the markings on the contrary less strongly expressed. It is said to be the prevailing form in Finland and Amurland, but occurs as an aberration elsewhere; probably it may be the form described from France by FABRICIUS as *circularia*, but I am not sufficiently certain to feel justified in changing the name. — ab. **depulsa** Bastelb. (4m) is a form in which the ocellated spots, at least on the hindwing, are reduced to small dark (or occasionally red) dots. In extreme cases, the ocellus of the forewing also gives place to a mere dot, but more often — as in the specimen figured from the BASTELBERGER collection — a very small ocellus remains on this wing. Described from the Rheingau, an example also recorded by VON NOLCKEN from Esthonia. — ab. **decoraria** Newm. (= *subroseata* Woodforde = *ianthinarium* Stichel = *janthinaria* Rbl.) (5c) is a very beautiful form with the dark dusting much more dense and the rosy suffusion intensified, especially in the entire median area of the forewing. In consequence of the darkened coloration, the pale lines which accompany the antemedian and postmedian stand out very distinctly; the ocelli also show up distinctly but their dark circumscription is almost or entirely obliterated by the general darkening of the ground-colour; the outer half of the distal area is usually pale between the veins. Extreme specimens are nearly black, but there is a good deal of variation. In North Staffordshire this aberration is the commonest form and even the more typical examples are rather grey (ab. *griseolata*). This is attributable to their protective value on the darkened tree-trunks on which they rest in this district, so different from the almost white trunks to which the type is adapted. It will probably there supplant the type in the near future. WOODFORDE in naming the form overlooked *decoraria* Newman. This name was founded on a single specimen, without indication of locality, bred from a larva which was said (no doubt erroneously) to have been found feeding on the bedeguar or mossy gall of a rose in a garden; it passed into the hands of BOND and was figured (uncoloured and without mention of the name) in the "Entomologist" vol. 9, pl. 217 and again more recently (coloured) in BARRETT'S "Lepidoptera of the British Islands", vol. 7, pl. 328, fig. 2d. On account of the existence of a confusingly similar aberration of *C. orbicularia* (ab. *namurcensis*) I have examined the type specimen, which is now in the SYDNEY WEBB collection, and find that BOND, BARRETT and WOODFORDE are right in referring it to the present species; it is a rather extreme development, with the pale lines narrowed, of the form which has recently passed among British entomologists as *subroseata*. *ianthinarium* Stichel is a further synonym; its author erroneously confused it with *orbicularia* ab. *namurcensis* and this misled me into recording the occurrence of the last-named in England as "*orbicularia* ab. *ianthinarium*" (Ent. Rec. vol. 24, p. 25); but the specimen on which it was founded (beaten from birch at Arneburg, 11th August 1897, by THURAU) has been examined by my friend Mr. E. M. DADD and is pronounced by him to be certainly a slight modification of the *pendularia*-form usually known as *subroseata*, the pale lines (as in the type *decoraria*) narrow, "but with the veins for about 2 mm from the distal margin streaked with pale cream-colour, giving it a very beautiful appearance". REBEL, indeed, has already (Berge's Schmetterlingsbuch) transferred the name *ianthinaria* (emended to *janthinaria*) to the correct species; but, unacquainted with the existence of a parallel form of *orbicularia*, he has created new confusion by sinking to it *namurcensis* Lambill. — ab. **subochreatea** Woodforde is a rare modification of ab. *decoraria* in which the median area of the forewing is suffused with an ochreous colour instead of rosy; the ground-colour is dark grey, as in the least extremely dark *decoraria*, the blackish circumscription of the white discal spots discernible. WOODFORDE bred a few examples from N. Staffordshire together with ab. *decoraria*. — ab. **radiata** Delahaye, founded on a single, very fresh ♂, taken in May at Pignerolles, has black rays extending along the veins from the antemedian line to the base and from the postmedian to the distal margin, on both wings above and beneath. — ab. **nigrostriata** Lutzau is another rayed form, described as follows: yellowish grey, median shade blackish-grey, indistinct on fore, — distinct on hindwing; both lines of black dots distinct on fore —, obsolescent on hindwing; beyond the postmedian pale belt a broad blackish-grey marginal band, on which the veins are marked in black. One specimen, taken on 10 June at Wolmar, Livonia. The name would be applicable to all aberrations showing the dark band and black veins distally. — ab. **obsoletaria** Lambill. has the antemedian line of both wings almost obsolete. This and the three following aberrations were noted in FOLOGNE'S catalogue as occurring in Belgium; FOLOGNE'S note was no doubt useful as indicating

the general range of variation, but it is by no means so certain that LAMBILLION has done equally good service in imposing separate names upon them, especially as they were not very fully characterized. It is, however, necessary to quote them, if only to prevent future writers from multiplying synonyms through ignorance of them. — ab. **linearia** Lambill. Median band strongly developed. This band is described as "brown", which evidently refers to the blending of the dark-grey and red scales. I take the aberration figured by BARRETT, pl. 328, fig. 2c as a good illustration of this form. — ab. **unicoloria** Lambill. "Macular band of distal margin obliterated". Probably LAMBILLION regarded as typical a rather common form with moderately strong subterminal shading (about as that of our figure of *porata*, 4o), and would regard our *pendularia* figure as intermediate between that type and true *unicoloria*; in that case the latter will only differ from ab. *depulsa* in having normally developed ocelli. — ab. **brunnearia** Lambill. "Wings strongly charged with brown atoms". Here again LAMBILLION is scarcely sufficiently explicit. In ab. *griseolata* the atoms could not be called brown, so I suppose the reference, as in ab. *linearia*, is to the blending of grey with reddish scales, and that we have to do with the form mentioned by BARRETT as "suffused with reddish-grey". — A more striking form, figured by SCHWARZ ("Beiträge" vol. 2, pl. 3, fig. 1—2), has the ground-colour changed to a decided yellow, ab. **flavescens** ab. nov.; BARRETT mentions a similar example. — Hybr. **pendulo-orbicula** Tutt, obtained by HEAD from the crossing of *pendularia* ♂ with *orbicularia* ♀, is described as intermediate in appearance between the parent forms but nearer to *pendularia*; darker than normal *pendularia*, but not nearly so coarsely dusted as *orbicularia*, thus somewhat recalling ab. *decoraria* in its less extreme forms; the markings in general rather weak. Only a few examples were successfully bred, emerging as a second generation; they showed scarcely any variation. — Egg elongate-oval, the surface covered with a network of serpentine ridges, dividing it into very irregularly shaped cells; micropylar rosette with 8 rays; greenish white when first laid, changing gradually to yellowish grey blotched with red. Larva very variable, red-brown, purple or bright green, in the latter case with the head, legs and anal extremity some shade of red-brown; dorsal and subdorsal lines pale, the dorsal area between the latter forming, in the brown varieties, a smoky band; these varieties show also conspicuous dark subdorsal marks on the first 5 abdominals. Feeds on birch, occasionally also, it is said, on alder or oak. Pupa rather slender, broadened and somewhat flattened, broadest at anterior extremity, tapering gradually; anterior extremity truncate, with a sharp point at each shoulder; cremaster with 6 rather strong, strongly curved hooks; yellowish brown or greenish, dorsal area with grey dots arranged in 4 irregular series; wing edged dorsally by a broad black line. Imago in May-June and again more sparingly July-September. Seasonal dimorphism rather slight, but the second brood shows a larger percentage of specimens with strong reddish suffusion, perhaps also more of the blotched specimens, parallel to second-brood *punctaria*. Inhabits North and Central Europe, Northern and Central Italy, S.E. Russia and S. Siberia; an unnamed local race, unknown to me, is said to occur in the Western Thian-Shan.

C. orbicularia Hbn. (4n). Closely related to *pendularia*, forewing with apex slightly more acute, or even minutely produced, distal margin appreciably more convex, hindwing with distal margin slightly more irregular, approaching the subcrenulate form and with an appreciable tooth at the 3rd radial; wings much more strongly and coarsely dark-dusted, the course of the lines more irregular, the median shade (which is seldom wanting) strongly dentate, or jagged, the postmedian dots (or dashes) more out of alignment, indicating more definite curves of the line proximad between the radials and in the submedian area and distad at the 3rd radial to 1st median; discal spots oftener small, particularly that of the forewing (but variable in both species). Under surface similarly darker, the postmedian line on an average less well expressed. — ab. **namurcensis** Lambill. is uniformly blackish grey, tinged with reddish in the middle, almost exactly as in the middle, almost exactly as in the most extreme form of *pendularia* ab. *decoraria*, though considerably darker and less variegated than in average examples of that form. The two narrow pale bands usually remain conspicuous, but in one extreme specimen bred in England even these are almost obliterated and the only conspicuous pale marking remaining is the discal spot of the hindwing. In any case ab. *namurcensis* can be distinguished from ab. *decoraria* by the shape of the wings and nearly always by the course of the postmedian line; SNELLEN referred to these points in describing (without a name) the type-specimen of *namurcensis*, which moreover was bred from a larva found feeding on sallow, and REBEL must have overlooked this evidence when he referred it to the wrong species. Unfortunately the characteristic jagged median shade is lost in these melanotic forms. LAMBILLION's type was bred at Namur. No other examples were known until quite recently, when Mr. W. H. HARWOOD bred some, in England, also from sallow larvae and even blacker than the type, the thorax also darkened, which was scarcely the case in that. — hybr. **orbiculo-pendula** Tutt. In June 1902 H. W. HEAD obtained a pairing of *orbicularia* ♂ with *pendularia* ♀, which resulted in a good batch of fertile ova. Four or five dozen moths emerged, all in July-August the same year. They were very similar to the ♂ parent, only slightly paler, less coarsely dusted, more uniform; the reduction of the reddish median band and in part the course of the lines gave them, however, some aspect of their relationship to *pendularia*. — hybr. **brightoni** Tutt. This hybrid was obtained as long ago as 1859, from a pairing of *orbicularia* ♂ with *linearia* ♀, by H. COOKE of Brighton, and received from TUTT in 1905 the strangely-

formed name of *brightoni*. 8 eggs were laid and all produced larvae; these varied very much, some being similar to each parent, others intermediate. Unfortunately only one was successfully reared and this is *headi*. described as much more like *porata* or *pendularia* than either of its parents. — hybr. *headi* Tutt. This cross (from the pairing of *orbicularia* ♂ with *annulata* ♀) and the reciprocal one (*annulata* ♂ *orbicularia* ♀) were also obtained by H. W. HEAD, but the only moth bred from the latter was a cripple and is not described. The few examples successfully reared of hybr. *headi*, from pairings in June 1902 and June 1903, emerged as second brood at the end of July. "White, tinged with ochreous and sprinkled with minute dark grey specks; there are 2 dark purplish-grey, transverse, zigzag lines, which more or less coalesce, the outer line being nearly black. The discoidal spots are clear and well defined; between the discoidal spot and the base of the wing there is also a third faint, dark grey line; a row of black dots on the outer margin of both the wings". — Egg similar to that of the preceding species and undergoing about the same colour changes. The larva is as variable as that of *pendularia*; often bright green, with the lateral area either white throughout or marked with delicate pink or pale purple blotches; often pale brownish, sometimes even almost whitish, the dorsal area being comparatively weakly marked with greenish, grey or brown; according to a magnified drawing accompanying HEYLAERTS' account in SEPP's "Nederlandsche Insecten" it appears that this effect is produced by alternations of very fine coloured and white lines; dorsal line fine, yellowish, dark-bordered but not conspicuous; first five abdominal segments each with a thick, oblique smoky or blackish mark above the lateral area. Feeds chiefly on willow, but is said to be found also on alder. Pupa similar to that of *pendularia* but with less conspicuous dark line edging the wing-case dorsally, but somewhat more dark dusting on the sides of the abdominal segments. Double-brooded, the imago appearing in May-June and July-September, according to the locality and the season; in captivity a third, and even a partial fourth generation can be reared. Apart from the striking form described above, it is less variable than the rest of the genus, though some specimens are more strongly dusted than others, with the markings consequently obscured, while some, on the other hand, show in addition to the lines some blotches in the distal area, especially towards the posterior angle of the forewing. Bred specimens almost always show a decided reddish admixture in the median area, but it fades after the insect has been on the wing a few days. Very local in Central Europe, S. Sweden, S. Russia, S. France, Bilbao, N. Italy and S. Tyrol.

albiocellaria. **C. albiocellaria** Hbn. (= *ocellaria* Hbn. = *argusaria* Bdv.) (4n). Bright ochreous, slightly clouded with reddish, the median shade strong, but ill-defined, being more or less diffused into thick black dusting, which broadens posteriorly, often occupying a great part of the posterior (inner) margin, especially on the hindwing; discal spots pure white, large, sometimes very large, black-ringed; lines strongly dentate, the postmedian of forewing sometimes only marked on the veins; a weak dark subterminal shade sometimes present; the area distally to this pale; proximal half of fringe ferruginous brown. Under surface much paler and more feebly marked. — f. *therinata* Bastelb. (4n) is smaller, the black dusting much reduced in extent, the red shading, on the contrary, stronger; it is the summer form (second generation) of *albiocellaria*. — Larva green, greenish yellow or velvety brown, tinged with reddish anteriorly and posteriorly, dorsal line darker, strongest on the anal segment; middle segments usually each with an oblique dark dorsal line, but these are rather inconstant, only that on the 2nd abdominal always present. Feeds on species of *Acer*, especially on hedge-maple. Pupa light yellowish, with double series of large black dorsal dots, blackish wing-margin and dark veins. The first brood emerges about the middle of April, the second in July. Central and Southern Europe, local and chiefly in the eastern parts, but occurring in Central France, Corsica and N. Italy; also in Asia Minor, N. Persia (BIENERT) and, according to STAUDINGER, in a local form in Transcaspia. BASTELBERGER considers that the latter does not differ essentially from the European.

lennigiaria. **C. lennigiaria** Fuchs (4n) is exceedingly like the preceding species, and some writers have denied that it is more than a local form of it. Darker (more leather-coloured) with more reddish admixture but less extended black, the ocellated spots smaller and less rounded (more oblong), distal area less noticeably pale, proximal half of fringe brighter ferruginous, under surface (of typical form) more grey-dusted. According to FUCHS the markings more recall those of *pupillaria* ab. *gyrata*, and he has given a very detailed differentiation from that form, which seems to me quite superfluous. BASTELBERGER adds that in the aggregate the hindwing of *lennigiaria* is rather more strongly angled than that of *albiocellaria*, but not strikingly. — f. *aestiva* Fuchs, the second-brood form, bears about the same relation to the type as does *therinata* to *albiocellaria*, being considerably smaller and lighter. — The larva seems to be confined to *Acer monspessulanum* and will not even accept other species of *Acer* in captivity. It is very variable; green, yellow-green, yellow, brown-yellow or even reddish, head brown-yellowish; 1st—5th abdominal segments in strongly marked specimens with the anterior half darkened dorsally; dorsal line blackish brown, double on the posterior segments, broad on the anus; short black-brown oblique lines border the dark portion of the middle segments; a fine dark lateral line. Occasional larvae are unicolorous, or intermediate between these extremes. Pupa green, straw-

colour or darker yellow, dark-dotted, the wing-cases somewhat darkened, the anal extremity reddish. Inhabits the Rheingau, the first brood from the middle of April to the beginning of May, the second from about the 12th July till near the end of August.

C. annulata *Schulze* (= *annularia* *F.* = *omicronaria* *Schiff.* = *circulifera* *Geoff.* = *denticulata* *Thnb.*) *annulata*.
 (4o). Nearest to *albiocellaria* but very easily distinguished. Distal margin of forewing somewhat more regularly shaped (in the two preceding species more prominent about the 3rd radial), ground-colour lighter, without reddish admixture, median area (except in very rare aberrations) without black dusting, excepting between the median and postmedian lines, hence forming a more definite band; ocelli less pure white, almost concolorous with ground-colour, rather irregular in shape, occasionally obsolete; dark subterminal shade usually better developed; proximal half of fringes not darkened. In general not very variable, though in some examples the space between the median and postmedian lines is entirely filled up with blackish scales, forming an unbroken band, which is sometimes broadened, especially in Dover specimens; all transitions occurs between these and the form figured, in which the dusting is quite slight. The most noteworthy aberrations are two which have hitherto only been recorded from Devonshire, England; the former of them, at least, is recurrent, though not supplanting the type; the latter is a more extreme and very rare development from it. It is interesting to observe that the disappearance of the ocelli in these forms follows the reverse order to that noticed above in connection with *pendularia* ab. *depulsa*, where it is that of the hind-wing which is first affected. — ab. **obsoleta** *Riding* lacks the ocellated spot of the forewing. In reality, it is only the black *obsoleta*.
 ring which is entirely obsolete and the position which it would have occupied is still indicated by a few pale scales, observable with a lens. — In ab. **biobsoleta** *Riding* the ocellus of the hindwing is also wanting, *biobsoleta*.
 although again some pale scales indicate its position. — **aestiva** *form. nov.* (gen. aest.) is smaller than the *aestiva*.
 type, of a deeper, more ochreous colour and with an increase of dark dusting over the entire surface, although as this is grey, not black, and is very minute it does not produce a very striking effect. — Larva usually green with clear yellow dorsal and subdorsal lines; ventral surface much paler green, black at the segmental incisions; head moderately large, often brown, even in this green form of the larva. Dimorphic like its congeners but — at least in my experience — the brown form is relatively much scarcer than in most of them. Feeds on maple and sycamore. Pupa very similar to that of *pendularia*, the dark dorsal line of the wings not quite so deeply coloured as in that species, yet very distinct; in the only empty pupa-case which I possess there is also a large conspicuous dark discal spot on the wing-case, which is lacking in all the other British species; I have no note whether this was equally conspicuous in the living pupa nor whether it is constant, but I suspect that this will prove to be so. Double-brooded; the moths of the first generation appear rather earlier in the spring than most of their congeners, and the second brood has been bred as early as 30th June (*Riding*), 3rd July (*L'Admiral*), etc.; but the later part of July and the month of August are probably the normal times for the second brood. *Hormuzaki* records having captured a third-brood specimen at the end of October. Distributed through Central and parts of Southern Europe, also occurring in the Brussa district and Armenia.

C. pupillaria *Hbn.* (= *porata* *Wrnbg.* nec *L.*) (4o). It is not impossible that *Hübner* in naming *pupillaria*.
 this species was really misidentifying the *pupillaria* of *Brahm* (= *pendularia*); but as *Brahm's* work is good. it is not probable that such a mistake could have occurred and in any case *Hübner* nowhere cites *Brahm's* name to the present species. I therefore regard it as an independent creation and as there is a slight difference in the spelling (though it was later changed to *pupillaria*) it escapes the operation of the laws which disallow homonymy. An exceedingly variable species, but nearly always easily recognized, even apart; from the structure, by the peculiar reddish or reddish-orange shades of colour. The red of *porata* (when strongly developed) and of *quercimontaria* is of a different shade and never forms the essential ground-colour. Palpus appreciably longer than in the rest of the genus. Forewing with apex acute and minutely produced hindwing slightly variable in shape, distal margin often almost rounded, the elbow at the 3rd radial alway, quite slight, on an average slighter than in the *punctaria*-group. The type form is of the relatively pale colour shown in our figure, the discal spots rarely so strong, the lines (as there indicated) nearly obsolete, consisting of minute dark vein-dots; no median shade. — ab. **badiaria** *Stgr.* (4o) is of a much deeper brown- *badiaria*.
 red colour with the lines almost obliterated, the only distinct markings being the ocellated spots. *Staudinger* records it from Catalonia and Central Italy; my examples are from the Island of Capri. — ab. **gyrata** *Hbn.* *gyrata*.
 (4o) is a much more strongly marked form, sometimes, indeed, quite striking; unfortunately we had not one of the best-marked examples available for figuring. In this form the dark median shade is always present, and the lines of dots are usually enlarged. The ground-colour varies considerably in these strongly-marked forms and I have seen one or two in which it might be called orange rather than red. Abdomen often with distinct red dorsal spots. Appears chiefly characteristic of southern localities — S. France, Spain, Algeria, etc. — ab. **nolaria** *Hbn.* (4o) has also the two lines of dots strongly developed, but differs from ab. *gyrata* *nolaria*.

in the absence of the dark median shade. — These four names, if applied with a little latitude, cover sufficiently the general range of variation, and it is quite unnecessary to add to them. There are some intermediates both in colour and in strength of markings, the median shade, when present, varies in width and in distinctness, the ocelli vary much in size and are occasionally blind, being filled up with the same dark reddish shade which normally forms their circumscription; occasionally even (though very rarely) they are absent, such specimens being entirely unicolorous. The egg is elongate-oval, broader at the micropylar end than at its nadir; the sculpturing appears to be similar to that of the species already described, the ribbing perhaps strongest on the shoulder surrounding the micropyle; pale yellowish, changing in a few days to bright orange and a day or two later becoming strongly spotted with crimson. The larva feeds not only on trees but also on various shrubs and perhaps low plants; MILLIÈRE mentions oak, *Cistus*, *Myrtus*, *Phillyrea* and *Arbutus* as foodplants. Head as broad as prothorax, yellowish, on the vertex red, body usually green, but very variable (more yellowish, brown or reddish); lines yellow, according to MILLIÈRE only a narrow subdorsal developed, but his figure shows a broad yellow lateral stripe; incisions yellowish; legs and anal flap red. Pupa dark green with some light lines dorsally and on the wing-margin; anterior points and anal extremity slightly vinous; under a lens the surface appears pale green sprinkled with white or black. The first brood of the moth, in warm localities, appears as early as March, and it may be met with, according to locality, throughout the summer. It is distributed in S. Europe, N. Africa, Asia Minor, Syria and Armenia; also found in Switzerland and S. Tyrol and BAKER records it from Madeira.

calaritana.

C. calaritana Trti. (7e), a recently described species from Sardinia, is unknown to me, but certainly closely related to the preceding. It must, however, be a valid species, for the ♂ antennal pectinations, according to its author, are twice as long. Larger than *puppillaria*, the ocelli conspicuously more broadly white, the ground-colour darker (chestnut or cinnamon red); otherwise quite similar and with similar range of variation. 8 specimens collected by KRÜGER at the end of March, Bosco dei 7 Fratelli, province of Cagliari.

porata.

C. porata L. (= *punctaria* Schiff. nec L. = *ocellaria* Haw. nec Hbn. = *circularia* Wrbng. nec F.) (40). This well-known species was first described by LINNÉ, but the description — if it is really referable to the *porata* of modern authors — is not so good as most of LINNÉ's and has given rise to much uncertainty. WERNEBURG conjectured that it applied to *puppillaria*, and even ZELLER, GUENÉE and STAUDINGER, who continued to use the name for the present species, attributed it to FABRICIUS and others rather than to LINNÉ. GUENÉE stated that the type was lost. Possibly it was never acquired by LINNÉ; but there is in his collection a small, rather blotched specimen labelled *porata* which I formerly supposed to be the type and which certainly belongs here. As LINNÉ calls his *porata* "media" not "minor", the authenticity of this example may need further investigation, though even as a "cotype" it would have some value in elucidating his conception. In any case FABRICIUS' determination was the oldest, and cannot at present be proved erroneous. *porata* is similar to *punctaria* and still more to the more strongly dark-dusted allies of *punctaria* — *ruficiliaria* and *quercimontaria*, but can be separated by the presence of a distinct white, dark-ringed ocellus on each wing, which is wanting or quite ill-developed in that group. Pale greyish ochreous, coarsely dotted or strigulated with grey, a strong red suffusion in the middle or over the greater part of the wings; lines formed by grey dots on the veins, or the antemedian sometimes continuous; median shade usually rather thick, not very sharply defined, less regularly curved than in the *punctaria*-group and often appearing more or less dentate on its distal edge; distal area of the forewing usually with some grey blotches, such as occur only in the second brood forms of *punctaria*, that is to say, not confined to the vicinity of the posterior angle; at the same time, the tendency for these blotches to extend in the second generation, and even to appear on the hindwing, so manifest in *punctaria*, is not wholly absent in *porata*. The red suffusion is generally stronger than in *punctaria* but less extended than in *quercimontaria*. *porata* is decidedly variable but (as in *pendularia*) the aberrations are not sharply defined. We quote all which have received names. — ab.

visperaria. **visperaria** Fuchs (= *aestiva* Hormuz.). Occurs among second-brood specimens which differ from the first generation only in size. Paler, with less of the dark dusting and less distinct lines, the underside whitish;

rubearia. distal blotches often better developed. Rheingau, Bucovina, etc. — ab **rubearia** Lambill. is diagnosed simply as having the "disc of the forewing reddish" and is therefore in reality nearly synonymous with the typical forms, although probably intended to indicate a definite accentuation of the reddish colouring; as BARRETT says, "Occasional specimens have the fore wings so much suffused with dull red as almost to obscure the

punctularia. markings". — ab. **punctularia** Lambill. has a well developed series of brown (grey-brown) distal spots on both wings. Extreme specimens of this form, with these spots very large and reaching the distal margin, present a rather striking appearance; in the type form the spots are weak, small and subterminal. — ab.

linearia. **linearia** Lambill. has the median shade unusually strongly developed, but is scarcely worth naming. — ab.

marginaria. **marginaria** Lambill. is described as having a brown macular band at the distal margin of the hindwing and must be, if the description is accurate, a very unusual form. Normally the distal blotches are best developed

on the forewing or, at most, equally developed on both. — Larva with segments rather distinctly marked and subdivided; head rather broader than prothorax, brown or reddish; body variable in colour and markings, bright fawn-colour or green, 1st—6th abdominal segments with oblique dark marks, broad at their anterior extremity, ventral area paler with dark markings, lateral area sometimes broadly white. A variety occurs which bears also blackish transverse dorsal markings. Feeds on oak and more rarely on birch; its reported occurrence on whitethorn lacks confirmation. Pupa more heavily dark-spotted dorsally than that of *pendularia*, the spots of the two mid-dorsal rows large and conspicuous; wing-veins very strongly marked, appearing somewhat darkened, the dorsal line of the wing moderately strong. Imago in May-June and again about August, in captivity sometimes even a third generation can be reared. Inhabits chiefly woods, resting by day in the shelter of thick trees, apparently preferring the small scrub oak. At night it is attracted by light and sometimes by sugar. Central and Southern Europe, Denmark, Northern Asia Minor and Armenia.

C. quercimontaria *Bastelb.* (40). In a measure intermediate between *porata* and *punctaria* yet nearer to the latter. BASTELBERGER in erecting the species calls attention to the following distinctions from *punctaria*. On an average smaller, forewing more rounded, the apex being less produced and the distal margin less convex in the middle; hindwing less strongly elbowed at 3rd radial, white discal spots present (in *punctaria* very rarely indicated), red dusting very bright and very extended, on the forewing leaving free a narrow costal and anterior distal area, hindwing not lighter than forewing, only with less red dusting, median shade of both wings thicker and overlaid with bright red almost throughout, fringes not mixed with red. From *porata* it differs in the absence of black circumscription to the discal spots, lack of dark subterminal shading, indistinctness or obsolescence of the rows of dots which represent the lines, straighter median line, etc. Subsequent investigation of the genitalia proved that it not only differs from *punctaria* and *porata* but even belongs to the opposite group in the structure of these organs, i. e. the *pendularia*-group, in which the "forceps" are wanting or quite rudimentary. From *ruficiliaria* *H.-Sch.*, which also falls into this group and has in many respects even closer affinity with *quercimontaria*, the latter differs so materially in colour that confusion could seldom occur; *ruficiliaria* is on an average larger, with darker ground-colour, grey (not red) dusting and median shade, and usually reddish fringes, not dark-dotted as is commonly the case with those of *quercimontaria*. The two broods scarcely differ except in size; indeed *quercimontaria* shows a marked contrast to its allies in its general constancy, though F. FUCHS records one aberration, in the summer brood, of a more intensive red and some other transitions, among 20 typical. The larva is brown (no green form is yet known), with lozenge-shaped dorsal markings on the 1st—5th abdominals, somewhat like those of *Eupithecia castigata*, which at once distinguish it from other *Cosymbia* larvae; otherwise it is nearest to that of *punctaria*, but more slender and entirely without the rust-red lateral spots which are normally present in that species. Feeds on oak, but seems more delicate and therefore less easy to rear than its allies. The moth is found sitting on tree-trunks. The first brood appears somewhat later than that of *punctaria*, namely in early June, but the larvae feed up very quickly, so that the second generation occurs from about the 20th July. Hitherto only known from the Rheingau, Lower Austria, Bosnia and Herzegovina but may probably have been overlooked in some places. RIESEN has recorded 2 examples from Zoppot (Danzig), a rather surprising locality.

C. ruficiliaria *H.-Sch.* (= ? *unilinearis* *Scharjenb.* = *gyraria* *Tr.* nec *Hbn.* = ? *hybridaria* *Selys* = *ruficiliaria*. *pupillaria* *Z.* nec *Hbn.* = *schaefferaria* *Lah.*) (40). Very variable, especially in the strength of the markings, so that the safest differentiation from the preceding and following species lies in the shape or in the ground-colour and dusting. In shape it is distinguishable from *punctaria* by its broader, comparatively more rounded wings, in this resembling *quercimontaria*, but on an average larger and more robust; the genitalia and the life-history also show it to be specifically distinct from that. Ground-colour somewhat darker and duller than either of its neighbours, more brownish (not so flesh-coloured as in *suppunctaria* nor so reddish as in *pupillaria*, with both of which species it has sometimes been confused); the reddish scales much less numerous, the grey ones darker (almost black), much sharper and more numerous. As in the allies, the postmedian line normally consists of a row of dots, but these are usually rather weak, sometimes scarcely discernible; when present, the antemedian generally forms a continuous, but very fine and not very conspicuous, strongly curved grey line, whereas that of *punctaria* oftener consists of a series of large dots; median shade usually well developed, grey, not overlaid with reddish, occasionally obsolete; discal spots, as in *quercimontaria*, small and white, not dark-ringed; terminal dark dots on an average weaker than in *punctaria*, but inconstant; fringes usually tinged with red, both above and beneath, but rather variable. — ab. **ruberrima** *Bastelb.* is a rare aberration from Hungary with more reddish ground-colour and much stronger red dusting, thus still nearer to *quercimontaria*, in which, however, the ground-colour remains light. — ab. **mattiacata** *Bastelb.* (40), occurring only in the first generation, is the largest, most strongly marked form, with rather thick, well-expressed median shade, strong series of dots (not well shown in our figure) etc. —

privataria. ab. **privataria** *Bastelb.* (5c) only occurring in the second generation, is the direct antithesis to the preceding, being small, with weaker and sparser dusting, the median shade and the rows of dots almost or altogether wanting, even the white discal dots sometimes almost obsolete. — ab. **circumdataria** *Bastelb.* is another second-brood aberration, characterized by the large white discal dot of the hindwing (usually elongate), which is distinctly surrounded with a blackish-red ring. There seems no constant difference between the first and the second brood except in size, and BASTELBERGER therefore proposed to include under the name *ruficiliaria* all except the extreme aberrations here indicated. We figure a second-brood example with the median shade nearer to the base than usual. The larva, especially in its earlier stages, is very distinct from that of *punctaria*. It is at first light green with a dark green dorsal stripe which, on strong magnification, is seen to consist of a series of spots, pointed anteriorly and posteriorly, while that of *punctaria* resolves itself into more brownish green forked marks. The full-grown larva is dimorphic, dark velvety green or violet-grey, not yellow-green or brown as in the two forms of *punctaria*. Head dirty straw-colour, streaked and dotted with sepia brown (in *punctaria* more red-brown); body more strongly shagreened than in *punctaria*, with white, irregular granules; lateral stripe (best developed on the 2nd—5th abdominals) intensive sulphur-yellow, without any admixture of red; ventral surface whitish green; anal claspers broadly margined with brown-red. Feeds on oak. The exact geographical range has scarcely been worked out, on account of the earlier confusion with *punctaria*. Certainly occurs in Central and South France, Belgium, Germany, Switzerland, N. and Central Italy, Austria-Hungary, Crimea and Asia Minor (Brussa). Double-brooded, the first brood appearing in April-May, the second about July-August.

punctaria. **C. punctaria** *L.* (= *teutonaria* *L.* = *fultaria* *Vill.* = *acutaria* *Roquette*) (4o). The principal distinctions between this well-known species and its relatives have been indicated in dealing with them, and our figure reproduces its markings so perfectly that no further description is needed. It is to be observed, however, that the typical form lacks the dark blotches in the distal area of the forewing, or has at most only a not very intense, reddish one at the posterior angle. The strongly blotched forms belong almost exclusively to the second generation and have been proved by the experiments of MERRIFIELD to be directly connected with high temperatures. He found that in all the moths which he could force from the pupae as a (partial) second brood these blotches were present, but that by icing the pupae the moths could be changed to the non-blotched, spring form, even when they emerged before the winter. The reduced temperatures also tended to produce an increase of the dark dusting and of the dark median shade, thus showing some definite analogy with the first-brood forms of *albiocellaria*, etc. In general *punctaria* must be considered a variable species, although the really remarkable aberrations are of very rare occurrence. A number of the more striking forms have been named, as well as some which can scarcely be called striking, and it has not been easy to work out their synonymy satisfactorily. — ab. **naevata** *Bastelb.*, proposed for those second-brood forms in which the distal blotches occupy the entire marginal area and are purplish, not grey, in colour, has given rise to some controversy, some lepidopterists having attempted to use the name comprehensively, for the entire second generation, while others have taken an entirely opposite view, regarding the name as untenable because the form is connected by all transitions with the type. Specimens with more than one reddish blotch do even occur, though very sparingly, among the spring brood, probably chiefly in southern localities. I have never met with such in Britain, but DADD records 2, from England, dated 25th May and 31st May. In any case the extreme form, which BASTELBERGER expressly indicated, belongs only to the summer brood and the name, even though only as "ab.", is valuable. It cannot, however, be restricted as regards the coloration, as the blotches are occasionally grey. — ab. **foliata** *Fuchs* is a more extreme summer-brood development, both wings bearing a complete series of confluent distal blotches. In the few examples which I have seen, as is also given in FUCHS's description, these blotches are dark grey rather than purple, though some have more of a purplish tinge than others. — ab. **radiomarginata** *Joannis* is another development of this summer-brood form, intermediate between *naevata* and *foliata*; the grey colour in the distal area of the forewing is disposed in a uniform series of thick streaks along the veins which tend to become confluent proximally but are separated by narrow streaks of the ground-colour distally; in the hindwing the grey distal shading is, in the type-specimen, much slighter, but I have before me a fine specimen from the ZELLER collection in which it is fully as strongly developed as on the forewing and in the same rayed form. — ab. **subangularia** *Haw.*, of which the type is lost, seems to have been an unimportant aberration with the wings rather more angular than usual, the median shade more bent, especially on the hindwing, where it became angled. England. — ab. **infuscata** *Reuter* shows an increase of the fuscous dusting both above and beneath and a strong smoky band densely dark-dotted on each side. — ab. **arcufera** *Reuter* is a curious form in which the thick median shade of the forewing is very strongly bent basewards in the middle so that instead of running to the posterior margin it terminates in the cell towards the base. BARRETT describes a second example of the same aberration. — ab. **communifasciata** *Don.* (= *unifasciata* *Don.*) is almost without markings except a slender well-defined median shade. DONOVAN's figure shows a small, smooth-scaled form rather recalling the S

European *suppunctaria* but with the line (median shade) rather nearer to the base, strong black dots on the distal margin, no white discal dots. — ab. *cingulata* *Fuchs* agrees with the preceding aberration in that the median shade is the only strong marking, but differs in having this shade broad and coarse and accompanied on each side with some dark dusting. — ab. *pulcherrimata* *Fuchs* is a more brightly coloured form with the same thick median shade as ab. *cingulata* but in addition with strong rows of antemedian and postmedian dots and with the space between the median and postmedian almost entirely filled with dark dusting so as to form a band. BARRETT figures an example (pl. 326, fig. 2b) closely approaching ab. *pulcherrimata* and I have seen a very extreme example from Colchester. — ab. *demptaria* *Fuchs* is almost entirely without markings, even the median shade disappearing. Though always rare, this aberration is recurrent and examples occur in several of the largest collections. — ab. *venata* ab. nov. (= *punctaria* ♂ var. BARRETT, Lep. Brit. Isl. pl. 326 fig. 2e) is a remarkable aberration from the WOODFORDE collection, with dark lines on the veins extending completely from the antemedian to the postmedian on both wings, thus crossing the median shade, which is rather fine and weak. — ab. *ochreifusa* ab. nov. has the red suffusion replaced by a yellowish or ochreous, thus affording a parallel variation to *pendularia* ab. *subochreata* Woodforde as compared with *decoraria* Newm. There are two examples (British) in the LEECH collection and CLERCK in his "Icones" figured another under the name of *punctaria* (unless, indeed, his figure is incorrectly coloured, which unfortunately is sometimes the case). — The egg is apparently quite similar to those of the other species of *Cosymbia*, oval with a network of ridges, upper side with a rather large depression. Pale yellow, becoming blotched with red. Larva dimorphic, bright yellow-green or yellowish (or reddish) brown; head moderately large; dorsal line black, conspicuous on thorax and anally and forming a triangular blotch on the anal segments; 1st–6th abdominals with oblique dark subdorsal lines, broadly margined below with bright yellow, often including spots of rust-red. Feeds on oak and sometimes on birch. Pupa similar to that of *pendularia*, the dark dorsal dots larger and darker. The moth appears in April in warm localities, but May–June is the more usual time for the first brood; a partial second generation at end of July and in August. Hides by day among leaves or occasionally sits on tree-trunks. At night it sometimes visits sugar or heather-bloom. Inhabits Central and South Europe, parts of Scandinavia, and Asia Minor to N. Persia.

C. *suppunctaria* Z. (= *subpunctaria* H.-Sch.) (5c). Of this obscure and very local species, of which the specific right was often doubted until BASTELBERGER settled the question by the study of the genitalia, I have before me ZELLER's 4 originals. They are smaller than normal first-brood *punctaria*, but slightly larger than the average of the second brood. Easily distinguished by the much smoother, very uniform appearance of the ground-colour, due to the entire absence of the dark grey scales; a sparse sprinkling of red scales visible only with a lens, gives to the pale ochreous-brownish ground-colour a slight fleshy tinge. As in *punctaria* ab. *communifasciata* the only conspicuous marking is the fine dark reddish-grey median line, which on the forewing is slightly curved, on the hindwing almost straight; a fine curved antemedian (nearly as in *ruficiliaria*) is indicated but very rarely at all distinct, and the dark dots of the postmedian are not strong, a very weak terminal line consists of short strokes between the veins; according to REBEL there are usually white discal dots (not dark-ringed), but these are scarcely visible in ZELLER's specimens. Underside paler, still more weakly marked. Perhaps nearest in aspect to certain examples of *ruficiliaria* ab. *privataria* or to weakly-marked *linearia* f. *strabonaria*; distinguishable from the former by the less coarse dusting and smaller discal dots, from the latter by rather less reddish tone, less distinct antemedian and postmedian lines and smaller discal dots. The forewing is not quite so broad as in *ruficiliaria*, its distal margin not so sinuous as in *punctaria*; but its shape appears to vary somewhat. No striking varieties or aberrations are recorded; ZELLER's "var. b", with the antemedian and postmedian lines rather better developed than in the type-form, does not deserve naming. Very local, only known from Italy and the southern parts of the Austro-Hungarian Empire.

C. *linearia* Hbn. (= *trilinearis* Bkh. nec Hbn. = ? *luteolaria* Vill.) (5c) cannot be confused with any other species of the genus, on account of its brighter and deeper ochreous colouring. The postmedian series of dots is, with some exceptions, connected into a line and the antemedian line also is not broken up into dots; the median shade is well developed, except in one or two very extraordinary aberrations, but it varies greatly in thickness and in position; most commonly it is somewhat nearer to the postmedian than to the antemedian; white discal dots are commonly present but not conspicuous, not black-ringed. — f. *strabonaria* Z. (5c) is the second brood form and differs so constantly and so markedly that it was formerly believed to be a separate species. Besides being smaller, it is of a much more reddish tone, the lines sometimes more weakly expressed, sometimes more reddish, discal dots usually rather conspicuous, on hindwing often black-ringed. There can be no doubt that the change of colour is brought about by higher temperature and it may be conjectured that the (very rare) occurrence of ochreous forms in this second generation, which has been recorded in England and perhaps elsewhere, is due to exceptional climatic conditions. — ab. *nigrosarsaria*

Fuchs has both wings finely and densely dusted with black as far as the median shade, more densely in the median area than in the basal, the white discal spot showing up distinctly. Described from Germany. *fasciata*. BARRETT's pl. 327 fig. 1c shows a close approach to this form. — ab. *fasciata* Prout has the dark dusting placed between the median shade and the postmedian, resulting in a striking banded form parallel to *punctaria*. *infusata*. ab. *pulcherrimata*. Described from England. — ab. *infusata* ab. nov. is a still more remarkable form in the SYDNEY WEBB collection at Dover, with the entire surface of both wings strongly infuscated, nearly obliterating the lines but rendering the white discal spots conspicuous. It is figured and described by BARRETT (pl. 327, fig. 1e). — ab. *demptaria* ab. nov., named for the sake of uniformity with the parallel aberration of *punctaria* is a nearly unicolorous ochreous form with all the lines entirely obsolete. This is also figured by BARRETT (pl. 327, fig. 1a) and two British examples mentioned. — ab. *approximans* ab. nov. (BARRETT, pl. 327, fig. 1d) is also remarkable, the median shade on both wings being placed close to the antemedian; in the specimen figured the postmedian is reduced to a series of dots. — Several other interesting but less striking aberrations are of occasional occurrence, as for instance examples parallel to *punctaria* ab. *cingulata*, but it does not seem necessary to designate them separately. Egg elongate-oval, with fine hexagonal or rather irregularly polygonal ribbing; pale yellow, becoming marked with red. Larva dimorphic, green or brown, the latter the commoner form; very similar to that of *punctaria*, I have no opportunity of working out a differentiation. Feeds on beech and oak; HEINEMANN adds *Vaccinium*, for which I cannot trace the authority, while VOGEL says "on *Rhamnus frangula*" (!). Pupa similar to that of *pendularia*, the dorsal dots perhaps larger, not extremely conspicuous, wing-veins distinct. Double brooded. Central Europe, Southern Scandinavia, N. Italy, S. Russia, Armenia.

maderensis. **C. maderensis** Baker (5c). An exceedingly variable species, but easily distinguishable from all the preceding by its narrower wings, the forewing sharply pointed, with distal margin straight, rather strongly oblique. Ochreous, nearly always more or less dusted with purple scales, and with a very slight admixture of fuscous ones; discal dots white, variable in size, often minute, but always distinct, dark-ringed; antemedian and postmedian indicated by dots on the veins, which are sometimes connected into lines; median shade nearly always indicated but in varying breadth and intensity, crossing or placed distally to the discal dot on the hindwing; distal margin with black dots or short dashes between the veins. Under surface also variable, to some extent correlated with the upper, on an average rather lighter with sharply expressed median and postmedian lines; no antemedian; proximal part of forewing more or less suffused with greyish. Possibly the races from the three groups of Atlantic islands to which, so far as is known, the species is confined, will prove to be distinguishable in spite of the great variability of each. As the name indicates, it was originally described from Madeira. I have not seen many from the Canaries, where REBEL thinks it is somewhat less variable, more reddish, antemedian dots generally absent, etc., but the few before me do not confirm his opinion. On the other hand a series of 13 from the Azores suggests the possibility that here it is slightly smaller, slightly broader-winged, the rows of dots nearly always developed into lines. BAKER's type (here figured) is the form in which the ochreous ground-colour is only quite moderately dusted with reddish purple, yet sufficiently to produce a deeper, more red-ochreous tone than in the ab. *irrufata* Warr. All the markings are present, but rather indistinct, especially the antemedian; both the lines marked only by dots. The name should be used to include all the forms with the markings thus indicated or the antemedian absent, even if moderately strongly dusted with purple. Only the extreme forms need special names. — ab. *wollastoni* Baker (5f) was described from Madeira as a separate species and placed in the genus *Acidalia*; the antennae (except their extreme base) being broken off and the leg structure and venation overlooked, Mr. BAKER failed to recognize his *maderensis* in this beautiful form, in which the purple scales have covered the entire surface of the wings and the dark lines are obsolete, as also the dark circumscription of the discal dots. In the type specimen the pale yellowish line which nearly always follows the postmedian (though in normal forms little noticeable) becomes distinct. But in a second ♂, collected by Lord WALSINGHAM at Tacaronte, Teneriffe, 31st May 1907, this yellow line also has disappeared, though on the other hand the lines and median shade are still very faintly discernible. It should be added that the names *maderensis* and *wollastoni* were published simultaneously, the latter one page earlier than the former. I have — with the consent of the author — claimed the right given to the first reviser by the International Rules of Nomenclature, to select either of the simultaneously-published names, and have naturally preferred the one which designates the more normal form. *irrufata*. The very rare ab. *wollastoni* is parallel to *pendularia* ab. *decoraria*. — ab. *irrufata* Warr., also described from Madeira, denotes the opposite extreme, the ground-colour being clear ochreous, entirely without purple dusting. *trilineata*. — ab. *trilineata* ab. nov. has the dots connected into lines, the antemedian on the forewing acutely angled. Perhaps a local race in the Azores. REBEL describes an ochreous ♀ of it as an aberration from the Canaries, and Lord WALSINGHAM has bred a beautiful purplish ♂ from La Laguna, Teneriffe, 6th June 1907. — ab. *latefasciata*. *latefasciata* ab. nov. is another beautiful and striking form. Clear ochreous, antemedian line very faint postmedian wanting, median shade purple, widened into a conspicuous band. Tacaronte, 31st May 1907; (WALSINGHAM). — Larva green with brightly variegated lateral patches. WOLLASTON found in on "Hudson's oak", Lord WALSINGHAM (on Teneriffe) on *Erica arborea*. Imago May to August, no doubt double-brooded.

C. sympathica Alph. (= *albilineata* Stgr.) (5c). That these two names represent the same species is *sympathica*. quite certain from the entire descriptions, the locality, the figure of *sympathica* and the example of *albilineata* lent me by Herr PÜNGELER. The fact that ALPHÉRAKY placed it in *Timandra* and STAUDINGER in *Zonosoma* (= *Cosymbia*) is probably accountable for the duplication. Forewing not very broad, apex acute, distal margin appreciably bent in middle; reddish brown or ochreous, the veins sometimes darkened, the lines yellowish white, the first curved, the second on the forewing nearly straight, slightly oblique, on the hindwing more curved; discal dots white, scarcely dark-ringed; median shade entirely wanting. Under surface paler, weakly marked, first line wanting, discal dot expressed on the hindwing only; the forewing is somewhat darkened in the basal region. The type was taken in the Kuldja district on the 6th April, STAUDINGER described from 3 ♂♂ 2 ♀♀ from Margelan, one dated 25th August. The specimen before me is from Kuldja. STAUDINGER's Catalog only gives Ferghana and the Ili district as localities. Narrower-winged than the other species, except *maderensis*; the angle in the distal margin of the hindwing pronounced. I have not seen a ♂ hindleg and think it not impossible it may be 4-spurred, as ALPHÉRAKY implies; if so it would belong to the genus *Traminda* Saalm., which it closely resembles in shape and facies, but which is not otherwise known from the Palearctic Region. It is apparently somewhat variable in colouring. A light specimen before me shows rather strong dark shading distally to the first line and proximally to the second, and moderately strong dark circumscription to the discal dots.

Note. Several new species which have been detected during the progress of this revision, and after the plates containing the *Acidaliinae* had been arranged, are necessarily left unfigured for the present. It is hoped, if space be available, to figure them later.

Addenda.

to p. 63, *A. marginepunctata*:

ab. **argillacea** ab. nov. Ground-colour strongly sandy-ochreous, about as in *rubellata*, the usual dark *argillacea*. markings well expressed. Six specimens bred by me from eggs laid by a ♀ taken at Constantine, Algeria, all show the ochreous colour more pronounced than usual (thus either a hereditary tendency or an adaptation to some local environment), two being so very extreme that the form is clearly worthy of a name, the rest transitional.

to p. 79, *A. ornata*:

var. **paucisignata** Krausse is almost entirely white, only an indistinct dark blotch persisting in each *paucisignata*. wing near the hinder angle and the hindwing with a distinct black discal dot. Occurs in the mountains of Sardinia, at an elevation of about 700 m.

to p. 91, *Pt. rufaria*:

ab. **abnobarria** Reutti. The space between the 2nd and 3rd lines occupied by a dark band as in *aver-* *abnobarria*. *sata* L. A single example, from Herrenwies, August 1894.

to p. 119:

Pt. incalcarata Chrét. Under this name CHRÉTIEN has just described (February 1913) a new species *incalcarata*. from Digne, very near to *attenuaria* Rbr. in appearance but without spurs on the ♂ hindtibia and thus belonging structurally in the vicinity of *infirmaria* Rbr. It may further be distinguished from *attenuaria* by its relatively broader forewing, with costal margin a little more rounded towards apex, the apex less produced, distal margin less oblique; lines more sinuous, more scalloped, the subterminal less straight, more macular, the black border less continuous; antenna less thick. Egg ellipsoid, with about 14 furrows, their margins forming thick raised longitudinal ribs. The larva feeds on withered leaves and undergoes three moults at rather regular periods of 8 or 9 days, the final stadium lasting longer; shape "recalling especially that of *aquitana*" (which is therefore evidently known to the French entomologists, although I have found no published information), much attenuated anteriorly and thick behind, strongly carinated laterally and with the surface finely granulated, the granulations forming a series of lines, dark greenish grey, darker still at the incisions, 5th abdominal lighter, prothorax and mesothorax tinged with rosy; tubercles rather large, pale yellow, with a black point in the middle, which gives rise to a very short, clubbed hair. Pupa light yellowish brown, the wings a little darker, with the veins conspicuous. The moth is at least double brooded, occurring in May and August, but in captivity a further brood was reared in November, from August eggs.

to p. 146, *C. porata*:

venata. ab. **venata** ab. nov. Both wings, above and beneath, with long dark rays to beyond the middle. Described but not named by Gaul, who took an example on the Sabine Mountains, Italy. I have not seen it, but it is certainly parallel to *punctaria* ab. *venata* Prout.

to p. 151:

perpulverea. Pt. **perpulverea** Hmps. for 7b read 5e.

5. Subfamily: Larentiinae.

An extensive subfamily and distributed throughout the world, but generally less prevalent in tropical than in more temperate regions. Here belongs, indeed, a large proportion of the Alpine, Arctic and Antarctic species. It is also dominant in New Zealand.

Small or moderate-sized moths, in the majority of genera very easy to recognize superficially by the character of the wing-markings, which consist of a very large number of wavy transverse lines, those at the base often united by some dark shading (the "basal patch"), those in the median area often similarly united into a "median band" or at the least into two bars bounding the median area proximally and distally.

Face sometimes smooth, but much more usually roughened, commonly with a projecting cone of scales. Palpus moderate or long, rarely short. Metathorax usually somewhat prominent, often strongly tufted; abdomen often with small dorsal crests. Legs seldom aborted, with rare exceptions fully spurred. Frenulum generally well developed. Forewing almost always with single or double areole, in the former case formed by SC² arising from SC¹ and anastomosing with SC³⁻⁴, in the latter case SC² almost always arising from the cell, usually quite well removed from its apex. Hindwing with C anastomosing strongly with SC, usually to near the end of the cell; in the ♂♂ of one specialized group (*Lobophora*, etc.) remarkable secondary sexual modifications result in the wide severance of C from SC, a cross-vein near the end of the cell, however, always remaining to indicate the lost connection, so that even in these cases the subfamily cannot be confused with those in which vein C of the hindwing is free, or connected near the base only. From the few, exceptional genera in those subfamilies in which the strong anastomosis occurs, the *Larentiinae* may at once be distinguished by the forewing neuration.

The eggs are always laid flat, and are generally of very simple form, ovate with a more or less strongly marked depression on the upper side, and with the surface throughout quite shallowly pitted; at times one end is strongly truncate. The larvae also are, as a rule, of fairly simple form, more or less cylindrical, nearly smooth, without prominent humps or excrescences. They vary greatly in thickness, from extremely slender to very stout. Some feed on trees but the majority on low plants. The hibernating stage is variable, sometimes differing in the very closest allies, or even (as with *Xanthorhoë fluctuata*) in a single species. Unlike the previous subfamily, the great majority of species undergo their metamorphosis on or just beneath the surface of the ground, forming a more less compact earthen cocoon; only a few, in which the duration of the pupal stage is always short (such as *Plemyria bicolorata*) change among leaves, spinning a few threads. The habits of the tropical forms, however, are almost entirely unknown. The pupae are generally brown or red-brown, of moderate proportions or somewhat thick, in a few species (such as *Cidaria siterata*) with a beautiful purple bloom; the non-subterranean pupae lighter brown to whitish or occasionally green, not rarely with dark dorsal line and dark wing-veins, sometimes more elaborately spotted.

Very few of the moths fly by day and these are generally brightly coloured (as *Lythria*) or black and white (as *Eulype*). Possibly one or two of the latter, like *Callabraxas*, in which there is some yellow admixture (at least on the body) enter into mimetic relations with the *Abraxas* group of the *Geometrinae*, which are exceedingly abundant in the Eastern Palearctic Region and certainly nauseous. The vast majority of the Palearctic species, however, hide by day among bushes or sit with wings outspread on tree-trunks or fences. In the latter situations they are generally very shy and wary and fly off immediately on the approach of the collector. This is especially the case with those in which the cryptic adaptation is not very perfect, as already mentioned in our introduction, and affords a marked contrast to the general sluggishness of the better-protected Noctuids, the *Biston* and *Boarmia* groups, etc. under similar conditions.

The general arrangement of the subfamily in STAUDINGER'S Catalog, though containing much which can be unfavourably criticized, is sufficiently satisfactory on the whole to allow of our having followed it in the present work, except in the case of the large genus (or rather, assemblage of genera) there called *Larentia*,

which it is necessary to break up on the lines of classification suggested by MEYRICK, HAMPSON, Dr. TURNER and other modern workers; and even there, STAUDINGER's *sequence* of species has been preserved except where this separated species which needed to be placed together as congeners. Some of the genera here recognized are perhaps not very sharply defined; but every biologist will recognize the absurdity of placing in a single genus such diverse elements as *pyraliata* Schiff., *cambrica* Curt., *hastata* L., *obliterata* Hufn., etc. Some of these, indeed, are far easier to define generically than are some genera which STAUDINGER accepts, such as his *Ortholitha*. It may be mentioned in passing, that the name *Larentia*, which that author has substituted for the *Cidaria* of his 1871 edition, is entirely misapplied, as it does not even include the type of the genus (*clavaria* Haw. = *cervinata* Schiff.).

1. Genus: **Ochodontia** Led.

Face smooth, not protuberant. Palpus rather short. Antenna in ♂ bipectinate. Hindleg slender, with all spurs. Forewing with costal margin subconcave in middle, strongly convex near apex, distal margin with a rounded excavation between apex and 3rd radial, toothed at the latter; areole double, the proximal usually smaller; stalk of 3rd to 5th subcostals arising at or near the apex of the cell. Hindwing strongly toothed at 3rd radial, concave between this and the anal angle, costal anastomosing with subcostal to about the middle of the cell.

A somewhat isolated genus, of which only a single species is known. On account, perhaps, of its shape, LEDERER placed it near *Timandra*, in the *Acidaliinae*, overlooking that the hindwing structure absolutely contradicted his diagnosis of that group.

O. adustaria Fisch.-Waldh. (= *sareptanaria* Frr.) (7b). Forewing light fleshy ochreous, sometimes brighter pink, the costal area more or less broadly shaded with olivaceous, the lines fine, consisting of a single, straight antemedian and a pair of nearly straight postmedian, the first of them with some dark shading distally; very feeble indications of further lines in distal area are sometimes traceable. Hindwing at inner margin nearly concolorous with posterior part of forewing, the rest much lighter; antemedian line wanting, the postmedian pair more widely separated, one at least of the distal lines somewhat less shadowy than on forewing. Hindwing beneath more nearly concolorous with forewing above, the posterior part of forewing, on the contrary, paler than above. I know of no striking aberrations or varieties. Occurs from S. E. Russia and Transcaucasia to Eastern Turkestan. The larva, according to HOFMANN, is remarkable for the thickening of its anterior segments, which increase in width from the prothorax to the first abdominal, is then considerably constricted and afterwards cylindrical, segment-incisions rather strong; head small; body red-brown with yellowish lines, the dorsal double, subdorsal fine, emitting an oblique mark on the 2nd abdominal, lateral line broken into oblique streaks from the 2nd to the 6th abdominal. Feeds on *Euonymus europaeus*. The moth is double brooded. *adustaria*.

2. Genus: **Rhodometra** Meyr.

Face with rounded prominence, appressed scaled. Palpus moderate, rather stout, third joint small. Antenna in ♂ bipectinate. Legs normal. Forewing triangular, smoothly scaled; areole single. Hindwing somewhat amygdaloid, the angles being more or less rounded off, the distal margin pretty regularly convex; costal vein anastomosing with subcostal to about or beyond middle of cell, second subcostal arising from apex of cell or very shortly stalked with first radial.

A small African genus, of which two species, one of migratory habits, extend into Europe and Asia, in the warmer parts no doubt permanently established, but further north only occurring as an accidental visitor. Its nearest relatives (*Pseudosterrha* Warr. and perhaps *Anthemoctena* Warr.) are also exotic.

This genus was long called *Sterrha* Hbn., on account of a mistake of HERRICH-SCHÄFFER's, but not (as MEYRICK supposed) of a confusion between the names *sericeata* (the type of *Sterrha*) and *sacraria*. In his early and immature work ("Deutschlands Insecten") p. 104, HERRICH-SCHÄFFER formed a very unnatural genus consisting of *interpunctaria*, *jacularia*, *sericeata*, *sacraria* and *rosearia* (three non-Larentiid and two Larentiids) and to this he correctly applied the name of *Sterrha*. Later he redistributed these among more natural genera but, forgetting which was the type of *Sterrha*, retained the name for the wrong section. HAMPSON and SWINHOE have united *Rhodometra* with *Pseudosterrha* Warr., which has not the protuberant face, has much narrower wings with longer cells and shows some other differences.

R. sacraria L. (6a). Forewing yellow, costal margin usually narrowly rosy at base, a bright rose-coloured line or stripe from the apex to somewhat beyond middle of hindmargin; usually also with a minute discal dot and

occasionally with a rosy mark along the median vein from the 2nd submedian to the end of the cell. Hindwing white, unmarked. The ♀♀ are on an average rather less bright yellow, with the oblique stripe more brownish red, usually becoming fainter, or even obsolete, before the hindmargin. Both sexes are very variable. ZELLER ("Isis" 1847, p. 491) gave a good analysis of the seven principal forms, but it is not necessary to provide them all with names, as some differ only in a small mark. — ab. **labda** Cram. (= *atrifasciaria* Stefan. = *sarothamnaria* R. Brown = *ochracearia* Fuchs) (6a) is a form of frequent occurrence in the ♀, but rare in the ♂. The yellow ground-colour is changed to ochreous or buff and the stripe is brown or blackish, entirely without a rosy tinge, and very rarely reaches the hindmargin; it is usually accompanied distally by a pale line. — ab. **sanguinaria** Esp. (= *lividaria* Costa = *rosea* Ob.) (6a) has the forewing entirely or in great part suffused with rose-colour, the stripe usually but little darkened, but in the ♀ sometimes in part blackish; the hindwing is often smoky, not white. The ♀♀ of this form are generally less completely red than the ♂♂, some traces of the pale ground-colour remaining. Costa's figure shows a sub-aberration, with a conspicuous oblique yellow stripe on the rosy ground-colour, no doubt an extension of the pale line observable in ab. *labda*. — ab. **excaecaria** Fuchs, founded on several examples from Jerusalem, is unicolorous yellow, without markings. I have never seen such specimens. — ab. **minervae** Gistel is very briefly described (as a separate species) as whitish with an oblique chestnut-coloured stripe from the apex both above and beneath and must be a pale form of *sacraria* — unless possibly it was founded on a faded specimen. It was taken in Greece. It should be added that *philaearia* Brabant, doubtfully cited by STAUDINGER to *sacraria*, is clearly, according to the description, identical with *Pseudosterrha gayneri* N. Rthschd., the African representative of the Indian *Ps. paullula* Swinh., which will be discussed in Vol. 12. The egg of *sacraria* is very distinct from those of all other known Larentiids, being remarkably elongate; it is covered with small round red spots, somewhat as in *Acidalia* or *Cosymbia*. Larva elongate, cylindrical, smooth; dark green, mixed with white dorsally, the ventral surface whitish, a fine brown dorsal line and a broad yellowish white lateral stripe. Polyphagous on low plants, feeding up rapidly. Pupa elongate, yellowish, dotted with black, the wing-cases dark. The moth occurs throughout a great part of the year, in a succession of broods. It is easily disturbed by day, but no doubt flies at night, and may be captured at light. The resting posture is somewhat like that of certain *Pyralidae*, the wings forming a steep triangular roof. Throughout S. Europe, S. W. Asia, India and Africa, common as far south as the Cape of Good Hope. In Central and Northern Europe it only appears as an occasional immigrant, being evidently unable to withstand the northern winter. CRAMER's type of *labda* was said to be from Surinam, but this must be an error, as the species does not occur at all in the New World.

R. anthophilaria is an exceedingly variable species (or group of species) closely related to *sacraria*, but distinguishable by the position of the line and generally by the hindwing. The line of the forewing always reaches the posterior margin and anteriorly does not run into the apex but to the costal margin near the apex. The base of the costal margin is only extremely narrowly marked with rosy. The hindwing is usually dark grey, not white, and is marked with a white or very pale yellowish discal spot and postmedian line or band; in the (rarer) cases in which the hindwing is white it is generally less pure white than in *sacraria* and a grey line and grey distal border are nearly always discernible. — **anthophilaria** Hbn. (6a) is the form which inhabits S. E. Russia and Transcaspia to Palestine and is said to occur with other forms in N. Africa. The forewing is coloured nearly as in typical *sacraria*, or slightly less bright; hindwing usually dark grey, in the ♀ somewhat more whitish. — ab. **subsacraria** Stgr. (= *gegenaria* Alph.) differs in having the line of the forewing fuscous, perhaps on an average narrower, the hindwing whitish, though usually with traces of dark line and border. It is, according to STAUDINGER, the *sacraria* of EVERSMAANN and perhaps belongs entirely to the summer generation, as the early specimens (April) are said to be always small and dark, with rather uniformly dark hindwings, while the more extensive second brood (June-July) shows greater variation. Recorded from Sarepta and the Ili district. According to CHRISTOPH (Rom. Mém. Lép. vol. 3, p. 103) *gegenaria* is a variety of *albidaria* and certainly neither belongs to *anthophilaria*, though he thinks they may be forms of *sacraria*. — ab. **subrosearia** Stgr. (6a) is a not infrequent form in which the ground-colour of the forewing is rosy, only a discal spot and outer line remaining yellow; hindwing dark, sometimes blackish. Russia, Balkan Peninsula, Palestine. — ab. **albipunctaria** Alph., described from the Kuldja district, is of a brownish tone (in the ♂ more tinged with olivaceous), the whitish discal spot and outer line well expressed, the hindwing nearly as white as in *sacraria*. Recorded also from Transcaspia and North Africa. — **consecraria** Rbr. is of a rather indefinite colour, the yellowish ground-colour of the forewing being more or less strongly dusted with rosy, leaving the basal part, the discal spot and outer line more or less clear. Hindwing pale, though with distinct traces of the grey markings. Andalusia, Corsica and a transitional form in North Africa. Also as an aberration at Sarepta. — **albidaria** Ersch., from Turkestan, seems to differ very little from the preceding. It was described as red with yellow fascia, the hindwing white as in *sacraria*, and only distinguished from *subrosearia* Stgr. by the hindwing. It would thus appear to be more densely and uniformly irrorated with rosy than *consecraria*. — **rosearia** Tr. (7f) will very likely prove to be a distinct species, as the wings appear to be somewhat broader than in the other forms. It is extremely variable, and the reddest examples differ

little from *subrosearia* except in their larger average size. The yellow forms, on the other hand, show a characteristic broad rosy outer stripe and a rosy distal band, the fringes remaining clear yellow. In all the forms the hindwing is more or less dark, with pale spot and band. TREITSCHKE's type, from Corfu, was one of the intermediate forms, the yellow ground-colour dusted with rosy. Only known from that island and from Greece, the Corfu forms particularly fine and large. We figure an example from Athens, from my collection. — *elvira* Th.-Mieg, said to be from Spain (probably Albarracin) is described as a variety of *rosearia*, forewing *elvira*, sulphur yellow with costal edge, postmedian band and terminal band carmine, the latter ending at about the second median vein, hindwing rather paler yellow, the bands blackish brown; forewing beneath infuscated, hindwing nearly as above but with the bands carmine. — The larva of the form *anthophilaria* is unknown; according to PÜNGELER (in litt.) they would not accept any plant which was offered them. That of *rosearia* was discovered by ERBER on Corfu, feeding on *Alisma* sp.?, and is slender, grey-green, dark-dusted; pupa light brown, in a slight cocoon on the earth, the moth emerging in 10 days. ERBER found *rosearia* common in a few spots but exceedingly local; a few specimens, small and dark, were obtained in March, but the largest emergence was from the middle of May to the middle of June.

3. Genus: **Lythria** Hbn.

Face rough-scaled. Palpus long, with long projecting hair. Antenna short, in ♂ with long pectinations, in ♀ ciliated. Pectus and femora hairy. Hindtibia with all spurs. Forewing with single areole, the point of origin of the 1st and 5th subcostal nervules very variable, the 1st commonly from the apex of the areole or even very shortly stalked with the others, as in the Acidaliids; 1st radial not stalked. Hindwing with 2nd subcostal shortly stalked. — Egg oval, with the ends flattened. Larva very slender, smooth, cylindrical; feeds on *Rumex* and other low plants. The genus is a small and rather isolated one, confined to the Palearctic Region and indeed chiefly to Europe. Its nearest relatives are found in New Zealand and MEYRICK considers it an ancestral form.

L. plumularia Err. (= *rheticaria* Lah.) (5 g) differs from the other species in the 3 broad bands of the *plumularia*, forewing (the middle one at times interrupted), the presence on the hindwing of a black discal dot and distinct postmedian line or band, and especially in the strong dark olivaceous or blackish suffusion at the base of both wings and often along the inner margin. Otherwise all the European species agree in having a bright ochre-yellow ground-colour and purple-red markings, though *plumularia* is rather less bright than the others. It varies a good deal in the width of the bands; the first two are not infrequently more or less confluent, the third almost invariably remains separate and is never very narrow, nor broken up into dots, as sometimes occurs in the other species. It is extremely unlikely that there is more than a single generation and as the aberrations intergrade it is unnecessary to give them names. The larva is said to live on *Rumex acetosa*, but is apparently undescribed. The moth flies by day and is extremely local, being confined to the high Alps of Switzerland (Grisons and Valais) and the Tyrol. It is met with in June and July and according to FAVRE at elevations of 2000 m and upwards.

L. venustata Stgr. is unknown to me in nature. Structurally it is said to agree with *plumularia*, *venustata*, only the apex of the forewing and the inner angle of the hindwing appear somewhat sharper. Reddish leather-yellow or cream-yellow, traversed by three sharply defined, uninterrupted dark bands, more regularly parallel than in the other species, the first slightly convex, the third slightly bicurved, the second straight. The base of forewing and inner margin of hindwing are dark shaded. The under surface distinguishes *venustata* at once, showing no trace of a transverse band. Described on a ♂ from Zaisan.

L. purpuraria is more variable even than *plumularia*. It is distinguishable from that species by the characters indicated above and structurally by the somewhat less extremely long hairs of the palpus, femora, etc. It has only two bands on the forewing, not three. ♂ genitalia with valves large, subtriangular, bearing small, soft, hairy papillae at apex. — **purpuraria** L. (? = *cruentaria* Hufn.) (5 g) is the ordinary summer-brood *purpuraria*, form, the forewing yellow, more or less tinged with olive, the two bands rosy, the proximal incomplete, the distal rather narrow. A short and interrupted median very occasionally present costally. Hindwing brighter orange-yellow, rather narrowly shaded in inner-marginal area with olive grey, fringe rosy; no other markings or merely a weak postmedian line. Both wings beneath show the outer line, on the hindwing usually complete, on the forewing commonly reduced to a costal mark. — ab. **conjunctiva** ab. nov. (= *cruentaria* Bkh. nec *conjunctiva* Hufn.). The two bands of the forewing meet before the hindmargin (Hbn. fig. 199). — ab. **mevesi** Lampa *mevesi*, seems to be merely an unimportant transition to the following form; described as "ochre yellow, the bands of the forewing indistinct". STAUDINGER adds that they are grey. — **lutearia** Vill. (5 g) is almost unicolorous *lutearia*.

yellow, the bands nearly obsolete. Perhaps our figure, which is not very extreme, should rather be referred to *ab. mevesi*. The extreme forms belong chiefly, though not entirely, to S. Russia and Asia Minor. DE VILLERS named this form in 1789; STAUDINGER in 1901 overlooked this, but fortunately chose the same very suitable name. FUCHS included this form in his *abstinentaria*, but that belongs properly to the spring generation. — *ruginaria*. ***ruginaria* Costa** is apparently a more reddish fulvous modification of *lutearia*, with no trace of bands. Described from Naples. on several examples. CURO inclines to unite it with *sordidaria*, but its large size and bright colour preclude this. — *deceptoria*. ***deceptoria* Vill.** (= *abstinentaria Fuchs*) with the forewing almost unicolorous fuscous (really "blackish olive-green", as FUCHS gives) belongs entirely or almost entirely to the spring brood and is usually much smaller than the summer form. — *sordidaria*. ***sordidaria* Zett.** (5g, as *rotaria*) represents the less extreme specimens of the first brood, the bands being present, though indistinct, dark and dull. In Lapland, where the species does not appear till late in June, it is the only known form. — The egg is laid singly and is rather elongate oval, almost twice as long as its greatest thickness, the polygonal reticulation irregular, enclosing slight concavities which are covered with a uniform minute pitting; micropylar rosette 7—9-rayed, often partly or entirely covered by dark shading. Larva reddish, with double dark dorsal line, light subdorsal (continued on the head) and light lateral line. It feeds chiefly on *Rumex* and *Polygonum*. The first brood of the moth appears in April, but is much scarcer than the second, which is very common in many places in July and August, flying in open fields and similar localities. SENTENIS (S. B. Ges. Dorpat vol 3, p. 298) has recorded a halved gynandromorph, taken 27 June 1873, to which his attention was directed by its helplessness on the wing. *purpuraria* has certainly a wide range in Europe and probably Asia Minor, but some records may very likely belong to the following species. It is wanting in the Iberian Peninsula, in Britain and the Arctic Region.

purpurata. ***L. purpurata* L.** (= *cruentaria Guen. nec Bkh.*) (5g, as *cruentaria*) has been much confused with *purpuraria* but is most certainly distinct. ♂ genitalia with valves small, quadrangular, with papillae at apex as long as the valve itself. The two species were correctly separated by LASPEYRES, recognized as probably distinct species by DUPONCHEL and recently (1905 and 1907) worked out very clearly by DEMAISON, though under GUENÉE'S erroneous nomenclature. *purpurata* is smaller, somewhat shorter-winged, generally much more brightly coloured, the first band (or half-band) nearer to the base, the 2nd and 3rd both present but very closely approximated, generally entirely confluent or forking only close to the costal margin, thus forming one conspicuous broad band. The purple-red on the underside of the hindwing is generally much extended. Ground-colour of forewing in general somewhat more greenish, of *purpuraria* more yellowish, but both vary in this respect. — *demaisioni*. ***demaisioni* form. nov.** (gen. vern.) is parallel to the spring brood of *purpuraria* but rather smaller and the markings, when still present, show the same characteristics as the summer brood. Much scarcer. — *rotaria*. ***rotaria* F.** is almost certainly an aberration of *purpurata* with the proximal band of the forewing apparently wanting, the yellow underside unmarked. Germany. How the name comes to have been applied to *aucta*. the spring brood of *purpuraria* I cannot understand. — ***aucta* Krausse**, from Sardinia, is evidently also an aberration of *purpurata*. The subbasal purple band is broader and nearly reaches the hindmargin, the distal band very broad, hindwing with broad purple margin. Taken at light in June. I have a similar example before me, without exact locality. — The early stages have not been separately worked out. DEMAISON at Rheims and OBERTHÜR in the Pyrenees (f. *sanguinaria*) have noticed that the summer brood appears some weeks earlier than that of *purpuraria* and both agree with DUPONCHEL that it is not found (like its relative) frequenting cultivated fields. First brood in April (scarce), second in June and early July. Distribution not fully ascertained; certainly France, Germany, Holland, Norway, S. Italy. — *sanguinaria*. ***sanguinaria* Dup.** (= *numantiaria H.-Sch.*) (6b) represents *purpurata* in the Iberian Peninsula and a part Southern France; it agrees closely in the genitalia and in the habits, etc., and DEMAISON notes an intermediate form at Rheims. Larger, the 2nd and 3rd bands well separated, the 3rd much narrowed, generally broken up into dots or nearly obsolete, very variable. — In *ab. confluens* *Ob.* the forewing is strongly suffused with rosy almost throughout, the first two bands broadly joined along the median vein. — *vernalis*. ***vernalis* Stgr.** is the spring generation of *sanguinaria*, much smaller and darker, never sharply marked. — The larva of *sanguinaria* is very slender, recalling that of *Acidalia rubiginata*; blue-grey, with the dorsal surface red-brown; dorsal line fine, sharply white; subdorsal brown; a broad white lateral stripe, slightly undulate; spiracles very small, black-ringed. Polyphagous on low plants, but partial to *Rubia peregrina*. The first brood of the moth appears in April-May and seems scarce; the second and principal emergence is in June and early July. — *porphyrraria*. ***porphyrraria* H.-Sch.** seems to me to be certainly either a local form or an occidental aberration of *purpurata*, though its author maintained that it was certainly a distinct species. Forewing above uniformly rosy purple with only the hindmarginal area mixed with yellow in the proximal part; beneath yellow, with purple apex. Hindwing above normal, beneath almost uniformly purple. S. Russia. I have before me only one example, but have observed a quite similar underside in a specimen of *ab. aucta*.

4. Genus: **Kyrtolitha** Stgr.

Face nearly smooth. Palpus rather short, rough-scaled. Antenna in ♂ simple. Metathorax with small tuft. Abdomen not crested. Forewing with apex pointed, distal margin strongly oblique; areole double, first radial vein stalked. Hindwing with costal margin produced, running to a rounded point at the end of the 2nd subcostal, distal margin nearly straight; discocellulars biangulate. — Early stages unknown.

Erected for a single Asiatic species. Distinguished by the shape of the hindwing.

K. obstinata Stgr. (8c). Forewing whitish grey with a tinge of brown, the markings brown-or but not very sharply defined. A dark bar bounding the basal patch and a narrow median band the most conspicuous; the latter is really postmedian, its proximal edge running from about or just beyond middle of costa to middle of hindmargin, with deep, angular indentations on 2nd radial, 2nd median and 2nd submedian, its distal edge slightly indented on all the veins and the submedian fold and with a moderate projection between the 3rd radial and 1st median. Hindwing and underside almost unmarked, thus appearing whiter. Ferghana to the Tarbagatai Mountains. — **cinerata** Stgr. from Kashgar? (Issyk-Kul is given as the locality in the original account) differs in being ash-grey without the brownish tone of the type-form. — **roseata** Th.-Mieg from the Alexander Mountains has the forewing, excepting the median band, and the fringes of both wings strongly mixed with rosy scales. obstinata.
cinerata.
roseata.

5. Genus: **Larentia** Tr.

Characters of the following genus, but the palpus rather shorter, distal margin of both wings more crenulate, discocellulars of the hindwing biangulate. ♂ antenna bipectinate, with moderate (or rather short) branches. — Larva elongate, rugose laterally, the head rounded. Feeds on Malvaceae.

This genus, which I formerly called *Plerocymia* Hbn., is certainly the *Larentia* of TREITSCHKE, as I have elsewhere shown (Trans. City Lond. Ent. Soc. vol. 17, p. 21); the type (TREITSCHKE's first species) was selected by CURTIS in 1830. So far as is yet known it contains only a single species, inhabiting the western Palearctic Region.

L. clavararia Haw. (= *cervinata* Schiff. in err. = *fasciaria* Wrbng. nec L.) (6i). Forewings fawn-colour with browner basal patch, median band and distal shade, all finely and delicately white-edged distally, the median band also accompanied by a fine white line proximally, sharply indented on the submedian fold and more shallowly in the cell. Hindwing pale, becoming browner at the distal margin. The type form is generally known by SCHIFFERMÜLLER's name of *cervinata*, which was applied under a misapprehension, being simply an emendation of *cervinalis* Scop., and must be abandoned. RETZIUS in 1783 called it *Phalaena grisea fasciata*, but this is not a binomial. HAWORTH's is thus the oldest valid name known. — **pallidata** Stgr. is a pale race which occurs in Asiatic Turkey, Ferghana and about lake Zaisan. Forewing ochreous-brownish or brownish-grey. Unknown to me. — **datinaria** Ob. (6i), also unknown to me, seems likely to be another pale race of *clavararia*, or possibly a mere aberration. It was described from a single ♂ taken at Kef, Algeria, in November, and is said to be much greyer than typical *clavararia* (which also occurs in Algeria), with the course of the white lines which bound the central area somewhat different. — **fumosata** Trti., also from North Africa (Frenda, Oran), is a much darker form, described as of a blackish brown or smoke-colour, the lines thicker and more sharply expressed than in typical *clavararia*. Two ♂♂ taken in February. Should *datinaria* prove to be, as OBERTHÜR believed, a separate species, *fumosata* may probably represent a dark form of it. — The egg of *clavararia* is said to be spherical with the surface smooth, the colour light yellow; laid in autumn, not hatching till April or May. The larva is green, more yellowish at the incisions, which are well marked; traces of darker longitudinal lines, sometimes a pink mediodorsal line; tubercles white; spiracles black. It feeds on Malva, Althaea and allied plants, resting generally on the underside of the leaves. It drops to the ground when the plant is touched, and rolling itself up bears a remarkable resemblance to the seeds of the mallow. It feeds up rapidly and often pupates at the beginning of June, though some larvae linger on into July. They are generally plentiful where they occur. The pupa is rather stout, red-brown, the cremaster with a pair of strong, projecting points and some very slender curved hooks; enclosed in a slight cocoon on the surface of the ground. The moth appears in September-November and is not often disturbed by day, but may be captured with the net in the evening and is strongly attracted to light. It is widely distributed in Europe except the extreme north and south and is also recorded from Asia Minor, Transcaucasia and the Altai. clavararia.
pallidata.
datinaria.
fumosata.

6. Genus: **Ortholitha** Hbn.

Face rough-scaled, with a small projecting cone. Palpus of moderate length, rough-scaled, the terminal joint small. Antenna in ♂ usually bipectinate. Hindtibia with all spurs. Metathorax scarcely crested. Abdomen not crested. Forewing moderately broad, apex usually pointed, areole double, 1st radial arising from apex of cell or shortly stalked with 3rd to 5th subcostals. Hindwing with costal margin long, cell rather short, discocellulars oblique, not biangulate, neuration normal. — Larva of moderate proportions or rather stout, nearly cylindrical or somewhat flattened, rugose laterally, tubercles and setae often strong. Feeds on low plants and hibernates. The moths are night-fliers, indeed some of the best-known species are active later at night than most of the *Geometridae*, but they are very easily disturbed by day, generally flying a short distance and settling again.

Ortholitha is chiefly Palearctic and African, but is not a very sharply-defined genus, scarcely differing from *Cidaria* except in the elongate costal margin of the hindwing. It is strange that STAUDINGER and LEDERER separate them by a number of unrelated genera and that GUENÉE refers his *Eubolia* (= *Ortholitha*) to a separate subfamily, *Eubolidae*. WALTHER considers that the structure of the palpi is also distinctive in *Ortholitha*, but some of the other related genera seem to me to approach it quite closely.

A. ♂ antenna bipectinate.

coarctaria. **O. coarctaria** Schiff. (6h). Grey, dusted with brown; the lines brown, rather straight, the postmedian without any distal projection in the middle; median area not darkened, except sometimes between the 2 (or 3) lines which form its distal boundary (the postmedian lines). Cell-dot minute, often wanting. An apical oblique streak present, as in most species of the genus, but often weak. Hindwing very weakly marked. —
infuscata. ab. **infuscata** Stgr. is much darker, smoky brown but with some paler transverse stripes remaining, particularly in the distal area. It seems to be the prevailing form about Hamburg, in Jutland and again in the St. Petersburg district. —
tenebraria. ab. **tenebraria** Hbn. is a more extreme development, almost unicolorous smoke-brown or fuscous, with only the subterminal paler. It occurs occasionally with the preceding. — The life history has been well worked out by BRANTS. Egg oval, glossy, with very weak reticulation. Larva nearly cylindrical, slightly tapering anteriorly and posteriorly; head rather small, rounded, somewhat flattened in front; body yellowish grey with interrupted darker dorsal line, whitish lateral stripe and small dark spots behind the spiracles. Feeds on species of *Genista*, *Sarothamnus* and in captivity other Papilionaceous plants; undergoes 4 moults and is full-fed in 2—3 months. Pupa blackish brown, with long conical cremaster. The moth flies in May and June, with a partial second generation in August and is local on chalk soil in Central Europe and Asia Minor. Its habits are similar to those of *mucronata*, but it flies more wildly.

mucronata. **O. mucronata** Sc. (= *plumbaria* F. = *palumbaria* Schiff. = *turturia* Tr.) (6i) is larger than *coarctaria*, with which it nearly agrees in the straight or only very slightly curved postmedian line; but this line is single (at most only accompanied by some vague shading proximally), the discal dot is distinct, often rather large, the distal area almost always weakly marked and the colouring somewhat different, the ground-colour usually with a tinge of violet, the lines bright rust-colour or yellowish. Exceedingly variable. — English specimens often show some dark shading proximally to the postmedian line, but GUENÉE was in error in regarding this form as a local race; I name the form, ab. **umbrifera** ab. nov. —
umbrifera. ab. **nigrescens** Ckll. (= *obscuraria* Rothke = *luridaria* Bkh., Guen., nec Brahm) has the ground-colour of the forewing uniformly blackish grey, only the subterminal line usually remaining pale; lines as in the type form. Hindwing also darkened. —
luridata. ab. **luridata** Hufn. and Rott. (= *duponti* Th.-Mieg) is a less extreme aberration, only the area between the two lines being blackish grey, thus forming a distinct dark median band. As BRAHM changed the name *luridata* to *luridaria* in 1791, I consider *luridaria* Bkh. (1794) a homonym and have replaced it by *nigrescens* Ckll.; GILLMER confused the two forms. —
extra-dentata. ab. **extradentata** ab. nov. has the ground-colour normal, but differs from the type in having a conspicuous dark, dentate line in the distal area of the forewing, preceding the pale subterminal. Described by GAUCKLER (Ent. Nachrichten vol. 26, p. 372) but not named. It occurs occasionally in many localities. —
pallidaria. ab. **pallidaria** Lambill. is smaller, the ground-colour of both wings whitish grey, the antemedian and postmedian lines of forewing well marked. —
approximata. ab. **approximata** ab. nov. has the median area of the forewing greatly narrowed, the lines being placed close together. I have seen very few examples. — The egg is a rather flattened oval, with large oval depression on the upper surface and with a hexagonal reticulation which becomes much finer around the micropyle; colour pale yellow. The larva feeds on *Ulex*, *Cytisus* and species of *Genista*; it is of moderate thickness, with conspicuous fold, and bears a few short stiff bristles; the ground-colour varies, being sometimes almost uniform whitish grey, darkened sometimes with numerous longitudinal

lines or stripes, the dorsal area often with a dark band. It is full-grown in April or May, when it changes, in a slight cocoon, to a light brown pupa with dark wing-veins. The moth sits among grass or low plants and, although a true night-flier, is very easily disturbed by day. It is on the wing throughout the summer months and is common in the greater part of Europe except the most northerly and southerly parts; also recorded from Asia Minor and Transcaucasia.

O. langi Chr. (11a). Nearest to the following species, but very distinct. Coloration lighter and less varied, the markings of the proximal and distal areas consisting of wavy lines of about uniform intensity, without the dark basal patch and dark distal markings of *chenopodiata*, even the oblique apical streak not very strong. The dark median is also less variegated in colour and the hindwing very weakly marked. The ♀, which is here figured, is more yellowish than the ♂. Larva unknown, suspected of feeding on *Cephalaria procera*, which was abundant where CHRISTOPH discovered the moth. Flies in July and August. Abundant at Kasikoperan, Transcaucasia. Occurs also in the extreme north-east of Asia Minor. *langi*.

O. chenopodiata L. (= *limitata* Scop. = *mensuraria* Schiff) (6i). Yellowish brown, with numerous dark undulate lines; forewing with central area darkened, comprising two distinct shades, the middle being greyer, the edges more ferruginous. In addition, the ♀♀ are usually brighter yellowish than the ♂♂, but both sexes vary in tint. — ab. **monodii** Th.-Mieg (= *prieta* Ribbe = ? *fumata* Nitsche) is a dark form with both wings smoky above and beneath, median band very dark. Perhaps forms a local race in the North of England; the synonyms perhaps represent less extreme forms and *fumata* (said to be small) is possibly nearer to the following. — **grisescens** Hormuz., from the alpine and subalpine regions of Bukovina, is probably similar to *monodii* but is much smaller than the type, grey-brown, the postmedian line straighter than normal. — ab. **unicolor** Th.-Mieg has the forewing almost uniformly coffee-brown, with the median band not darker. Rather frequent in the south of France. — ab. **defasciata** Rbl., founded on a unique aberration in the CAPPER collection, has the antemedian line placed nearer the base than usual and the postmedian of both wings removed to less than 2 mm. from the distal margin. The median area of the forewing is thus extraordinarily broad and moreover it is of a uniform ground-colour, not darkened. RIBBE has recorded under this name 2 examples from Andalusia with no darkened central area, but these should probably be referred to *unicolor*. — ab. **violacearia** Lambill. is described as having the ground-colour of the forewing pale yellow and the median band violaceous yellow and is said to be very rare in Belgium. — ab. **medioprieta** Ribbe is described as having the basal area of the forewing above darkened as well as the median. If this refers to the entire area proximally to the median band, it must be a striking form. Founded on a single specimen taken in the Sierra de Alfacar. — **sibirica** B.-Haas is a local race from the Kentei Mountains, differing markedly in its lighter, more yellow-brown colouring. I have not seen it, but it was founded on a large number of specimens. — The egg is nearly spherical, slightly glossy, the polygonal pattern usually weak and irregular, somewhat variable, in part marked by small knobs at the angles; whitish grey, changing in a few days to dark yellow. The larva is moderately thick, of similar form to that of *mucronata* and with similar stiff bristles, the tubercles black, rather conspicuous; ground-colour grey or slate-colour, usually with distinct bluish tinge, the ventral area somewhat paler and more yellowish; longitudinal lines dark. It feeds on various low plants, especially Papilionaceae, but is very retiring in its habits and — in contrast to the imago — rarely met with. It is full fed in June. The moth appears in July and August, is extremely abundant in rough grassy or weedy places in the greater part of Europe and extends across Asia to the Amur and Ussuri district. It flies freely about midnight and is strongly attracted to light; but it is very easily disturbed by day, when it flies about restlessly but not very rapidly and is, as BARRETT says, very fastidious about choosing its next settling-place. *chenopodiata*. *monodii*. *grisescens*. *unicolor*. *defasciata*. *violacearia*. *medioprieta*. *sibirica*.

O. feliciaria D. Luc. and *Joannis* is unknown to me but is said to be near the preceding, with the forewing elongate, falcate at the apex and with sharply-defined white lines bounding the basal and median areas, the postmedian especially conspicuous. The ground-colour is brown, the basal and median areas slightly darkened. Only known from Tarf, near Calle, Algeria. *feliciaria*.

O. moeniata Scop. (6i) is a very easily-recognized species and in general not very variable. The broad median band of the forewing, darkened in its distal half and with a strong, pointed distal projection in the middle is very characteristic; the proximal edge of the band, on the other hand, is nearly straight. Ground-colour pale violet-grey, narrowly shaded with rust-colour or yellowish on either side of the fine white lines which bound the median area. — ab. **diniensis** Neuburger, described from Digne, is lighter, more yellowish, the median band more fawn-coloured. — Egg very small, oval, almost spherical, orange-yellow, surface shiny. Larva ash-grey, sometimes darker, sometimes more reddish, the surface sprinkled with dark brown atoms which mediadorsally are condensed into a row of spots and on each side of this row form two longitudinal lines (dorsal and subdorsal); ventral surface light brown-grey with brown stripes and a reddish medio-ventral *moeniata*. *diniensis*.

line; spiracles finely black. Feeds on broom and Genista. Pupa dull red-brown, with lighter incisions, cremaster darker. Imago in July and August, occurring locally in wooded districts in Central Europe, N. Italy and Transcaucasia.

obvallaria. **O. obvallaria** Mab. (6h) is only known from Corsica, where it occurs locally, and only in the mountains (1500m) in July and August. It somewhat recalls *moeniata* in the strong distal projection of the median band, but this projection is in *obvallaria* distinctly bifid, and the proximal edge of the band contains two strong angles. Basal patch of forewing dark grey, bounded by a dentate black line.

proximaria. **O. proximaria** Rbr., also from Corsica, is apparently scarce and I have no material before me. The distal edge of the median band shows a smaller projection than in *obvallaria*, consisting of a square-cut or slightly bifid lobe between the 3rd radial and 1st median, but posteriorly to this it forms a deep inward curve. The proximal edge of the band (which is narrower than in the two preceding species) is neither straight (as in *moeniata*) nor biangulate (as in *obvallaria*) but sinuous. The hindwing shows a distinct median line, following a similar course to that of the postmedian of the forewing. The larva feeds on Genista corsica and Ulex and was found by RAMBUR in March, but grows slowly, the moth not appearing till October. It resembles, according to MILLIÈRE, the larva of *peribolata*, and is brown, with a blackish dorsal stripe, which narrows posteriorly on each segment and bears a series of whitish triangular spots (sometimes, however, indistinct); ventral surface with two blackish bands and a red-brown medioventral line. Pupa subterranean, dull red, little elongate, conical, pointed, finely wrinkled and dotted.

peribolata. **O. peribolata** Hbn. (8a). Forewing light cinerous with the lines and bands fuscous; a thick line limiting the basal area is rather straight and oblique; the narrow proximal band of the median area somewhat variable, nearly straight or more sinuous, usually narrowing anteriorly, its broader distal band sometimes ill-defined proximally, distally with a rounded projection in the middle; a small but distinct black discal dot; the pale subterminal line straight, accompanied proximally by a dark shade, which widens anteriorly and joins the oblique dark apical streak. Hindwing shaded with fuscous, indistinctly marked, the postmedian line strongly outcurved in middle, a distinct, rather straight, pale subterminal line often present. Generally not very variable, though some examples show a brighter brownish tinge. STAUDINGER regards *sororiata* Dup. as an aberration of *peribolata*, which is certainly incorrect; DUPONCHEL's figure is puzzling and has been regarded by GUENÉE (probably correctly) as an aberrant *Carsia paludata*, by MILLIÈRE as very likely *proximaria*. — ab. *coarctata*. **coarctata** ab. nov. is a remarkable form with white ground-colour and much narrowed median area, forming a single brown band 2—3 mm in breadth; basal patch weak, apical streak present, the other lines almost or entirely obsolete. Taken by STAUDINGER in Andalusia, figured by MILLIÈRE (pl. 38, f. 7). — *magna* form. nov., from Algeria, is larger than the type form and (judging by the only example before me) with the proximal edge of the median band more strongly curved (S-shaped), the ground-colour less pale and the subterminal line of the hindwing entirely suppressed. — The larva is rather short, carinated laterally, the skin wrinkled, the segment incisions distinct; greyish yellow, sometimes tinged with green, with an interrupted black dorsal stripe, uninterrupted (but sometimes indistinct) subdorsal line and whitish lateral stripe. It feeds on Genista, Ulex and Calycotome spinosa and grows slowly, hatching in the autumn and reaching its full growth at the end of April or beginning of May. Pupa conico-cylindrical, elongate, reddish brown with the wing-cases tinged with green; said by MILLIÈRE to be remarkable for lacking the cremastral hooks which characterize the other Geometrid pupa. The moth appears in August and September and is common in parts of France (especially the south), occurring also in Spain and Guernsey and once in Valais.

duplicata. **O. duplicata** Warr. (12a) is a very distinct species. Considerably larger than *peribolata* (size of *bipunctaria*, etc.). Forewing whitish with dark lines, costal margin from base to postmedian fuscous; basal patch obliquely dark-edged; median band represented by two broad blackish bars from the hindmargin to the subcostal vein, narrowing anteriorly and directed somewhat obliquely distad; distal margin blackish, narrowing to a point at apex and enclosing, from 1st radial to hinder angle, a straight white subterminal line. Hindwing whitish, with some slight dark markings towards the apex and anal angle. Under surface ochreous suffused with reddish, hindwing with a discal dot and postmedian line. — In ab. *simplificata* Th.-Mieg, described from How-kow, the two black band of the median area are almost entirely united into a single broad triangular band, the white interspace being almost entirely suppressed. *duplicata* is distributed in the mountains of Tibet and W. China.

O. nasifera Warr. (11a) somewhat resembles the most sharply-marked *peribolata*, with the ground-colour slightly more whitish, but differs at once in the much more sharply pointed distal projection of the median band. The basal line is also less straight, being strongly bent basewards at both ends, the antemedian line is somewhat angled basewards on the median vein, forming curves anteriorly and posteriorly to this, and the subterminal line is not quite so straight. Moreover the discal dot is accompanied by a second (as in *bipunctaria*, etc.), which is scarcely ever the case in *peribolata*. Inhabits the North-western Himalayas in June. *nasifera*.

O. coelinaria Grasl. (8 c). Considerably larger than *peribolata*, basal line less oblique, often less strongly darkened, distal edge of median band rather strongly incurved between the radials, but with a much less pronounced, double distal projection between the 3rd radial and 2nd median. The median band is in general more broadly darkened, leaving only a narrow pale shade in the centre, and even this is seldom extremely pale; discal dot usually double, as in *bipunctaria*, but both minute. A variable species in coloration, particularly as regards the colour of the area distally to the median band, which may be almost pure white or strongly mixed with brown or ferruginous. The typical form, as described and figured by GRASLIN, has this area whitish, with grey lines, only the first of them (nearest the median band) fulvous-brown; the median band itself very dark, nearly black. The specimen was bred from the south of the Departement of Pyrénées-Orientales and — according to its author and Monsieur OBERTHÜR — has never occurred at Vernet-les-Bains, although the latter possesses 2 ♂♂ agreeing with it from Spain (Escorial). It must, I think, be a rare form. — **jugicola** Stgr. (= *vernetaria* Ob.) is the common form of the species, with the median band lighter and the distal area (especially in the ♀♀) more or less strongly shaded with brown or fulvous. This is not only found in Castile, as STAUDINGER gives in his Catalogue, but also prevails at Vernet-les-Bains, whence OBERTHÜR described and figured it. My own series, from various Spanish localities, shows a good deal of variation, some examples approaching — though not reaching — the type form. — **gerardini** Ob. is a more melanotic form from the Basses Pyrénées with the hindwing almost uniformly blackish brown, the paler parts of the forewing also darkened, giving to the entire wing a more uniform, more sombre appearance. In particular, the subbasal area is very little lighter than the median. STAUDINGER in 1870 described this form as *jugicola* var., but in his latest Catalogue he wrongly confounds it with typical *coelinaria*. — *coelinaria* is confined to the Pyrénées and Spain and flies in July; the race *gerardini* occurs at elevations of 1000 to 1300 m. *coelinaria*. *jugicola*. *gerardini*.

O. kashghara Moore (6 h) is a narrow-winged species and more weakly marked than most of the genus, the antemedian and postmedian lines being accompanied by very little dark shading in the central area; their form is shown in our figure. The very oblique basal line is rather indistinct except at the costal margin; the oblique apical streak is obsolete, but there is a dark mark at the costal extremity of the (almost obsolete) subterminal line. Discovered at Chiklik, south of Yarkand, at 4310 m. elevation, on 3rd June; apparently distributed in the Thian-shan range. *kashghara*.

O. similaria Leech (11 a) from Western China (Ta-chien-lu, Wa-shan and Ni-tou), May—July, resembles a large *peribolata*, but has the hindwing whitish, merely somewhat shaded with grey basally and towards inner margin, and shows, like *coelinaria*, a pronounced inward curve between the radials in the postmedian line of the forewing — somewhat deeper, indeed, than in that species. The pale band in the middle of the central area is rather sharply defined and nearly white and contains usually two very small discal dots. A whitish line, or narrow band, runs between the median band and the narrow whitish subterminal line. — **erschoffi** Alph. (8 c) is a somewhat more whitish, less dark-marked form from Koko-Nor and the Amdo district, with the hindwing still clearer whitish, the whitish band between the median band and subterminal of the forewing broader and more conspicuous and the discal dot single. I have seen very few, and am not sure whether the distinctions will prove constant. If not, ALPHÉRAKY's name (published June 1897) must sink to LEECH's (May 1897). *similaria*. *erschoffi*.

O. integraria Stgr. (11 a). Forewing with distal margin more oblique, the apex thus appearing somewhat sharper. The three fuscous bands (bounding the basal and median areas) well-defined, the first bent outwards in the middle, the second and third formed somewhat as in *peribolata* or *similaria*, but the third is of almost uniform breadth throughout; preceded and followed respectively by distinct fulvous-brown shades, which are characteristic of this species, especially of the ♂. The central part of the median area is almost clear white and contains two large discal dots, which are almost or entirely confluent. Hindwing dirty whitish. ♀ smaller and still narrower-winged. Samarkand in July, at about 3000 m. *integraria*.

O. sartata Alph. (6 h) is very similar to *integraria*, which ALPHÉRAKY thought was merely an aberration of it, but the margins of the central area are more dentate, the dark bands which this area contains are less sharply defined inwards and the fulvous bands which bound the median area are entirely wanting. Ili district to Ferghana, flying in June in the mountains. *sartata*.

supproximaria.

O. supproximaria Stgr. (11 b) is similarly coloured to *sartata*, but is very distinct in the form of the median band of the forewing, which shows a single pointed projection distally, herein approaching *sinensis*. The subbasal and antemedian lines are both rather strongly bent distad, and with more or less pointed projections on the two folds. Two very fine lines usually follow the postmedian, running parallel with it, but these are sometimes obsolete. Hindwing rather strongly marked, the postmedian line forming almost a right angle behind the 3rd radial and bending towards the anal angle from the 2nd median to the margin. The underside also, which in the nearly allied species is almost markingless, is here well marked, being grey-dusted, especially in the basal half and before the subterminal line, and showing a distinct, bent postmedian line. Ferghana to Issyk Kul, about the end of June. — The striking aberration mentioned but not named by STAUDINGER, with almost the entire median area of the forewing dark, leaving only a small pale discal and a second hindmarginal patch, may be designated ab. **fasciata** ab. nov.

sinensis.

O. sinensis Alph. (6 h) is an elegant species, the dark markings standing out sharply on whitish-grey, slightly brown-tinged ground-colour. The course of the lines is somewhat as in *supproximaria*, but the outward bend of the subbasal and the pointed projection in the postmedian are both exaggerated, while the antemedian shows two strong curves on the folds, separated by a sharp angle pointing basewards on the median vein; double discal dot strong. The hindwing is weakly marked, except in the darkest examples. ♀ smaller and narrower-winged than the ♂, otherwise similar. Somewhat variable in depth of colouring, but I know of no striking aberrations. Inhabits the mountainous country of Central Asia (the Thian-shan range, the Kurla and Amdo districts), flying in June.

appropinquaria.

O. appropinquaria Stgr. (6 h) was described as possibly a variety of *sartata*, from which it differs as follows: subbasal band narrower, mostly reduced to a mere line; antemedian straighter (less dentate or undulate), the band which follows it consequently more regular; discal dots united into a longer streak; postmedian less dentate, though otherwise similarly formed. The ground-colour is said to be darker grey, but I do not think this is constant. The hindwing in the ♀ shows a rather distinct, strongly curved postmedian line. The fringes, which in *sartata* are somewhat chequered, are in *appropinquaria* more uniformly coloured. S. Ferghana and the Amdo district.

subvicinaria.

O. subvicinaria Stgr., from the Caucasus, is unknown to me, except from the description and LEDERER's figure. Similar to *vicinaria*, for which LEDERER mistook it, the median band of the forewing somewhat darker brownish-grey, containing a lighter grey anterior patch; postmedian line quite differently formed, being waved or bluntly dentate, much as in *junctata*, its anterior part containing 3 short teeth, its projecting middle part 2 larger ones, its posterior part 2 smaller; antemedian line also more dentate; first dark line of hindwing more angled (in *vicinaria* bicurved).

vicinaria.

O. vicina occurs in two or three local races, even if the following (*burgaria*) be not also, as has been suggested, a form of it. In coloration and general aspect it rather recalls a small *bipunctaria*, but differs markedly in the form of the postmedian line, in the well-developed, scarcely lunulate white subterminal line, the strong apical streak, spotted fringes and several other characters. The posterior discal dot of the forewing is often weakly expressed. — **vicinaria** Dup. (= *zumsteinaria* Lah.) (6 h) is of a clear grey, or slightly bluish grey colour with only a very weak tinge of brown, which appears chiefly in the median band and the subterminal area. The median band is well developed, though enclosing a small pale patch anteriorly. Inhabits S. E. France and Switzerland from May to July, and is well assimilated to the rocks on which it rests. — A short series before me from Syria, from the LEECH collection, shows a more brownish tone. The specimens are also on an average somewhat less sharply marked, with less pure white lines following the median band. This form was misidentified as "*proximaria* Rbr." with which it has nothing to do. I propose for it the name of **brunnescens** subsp. nov. (11 b). Whether *vicinaria* from other Asiatic localities also belongs to this form, I have no means of deciding; STAUDINGER records the species from the Taurus, N. E. Asia Minor, Transcaucasia, the Ala Tau, etc., but considered the last-named intermediate towards *burgaria*. Some examples of *brunnescens* show some approach to the markings of *subvicinaria*. — **hyrcanaria** Stgr. is a large pale form hitherto recorded only from North Persia; distal area of forewing in particular always light, usually with very sharply dark lines following the band.

burgaria.

O. burgaria Ev. (= *bungaria* H.-Sch.) (8 a) closely approximates to *vicinaria* and *subvicinaria*. The edges of the central area are somewhat more dentate than in the former, but probably less so than in the latter. But *burgaria* is chiefly distinguished by its whiter colour, the median band of the forewing only darkened at its margins, the discal dots almost or altogether obsolete, the dark shading which in *vicinaria* accompanies the subterminal line very weak, in part obsolete; the proximal edge of the median band forms a more regular curve, whereas in *vicinaria* it is angled in the cell and then almost straight. *burgaria* inhabits the Ural and

N. E. Caucasus in May. I have no information regarding the variety or allied species which, according to STAUDINGER, occurs in the Changai Mountains, Mongolia.

O. libanaria *spec. nov.* ♂, 34 mm. Shape of *vicinaria*, markings more nearly as in *bipunctaria*, the median band widening gradually but decidedly in its anterior part and forming a rather stronger tooth behind the 3rd radial. Forewing light sand-colour slightly mixed with whitish, the lines darker sand-colour, in part (especially the two which stand nearest to the cell-mark) dusted with fuscous; cell-mark comma-shaped, strongly overlaid with fuscous; subterminal whitish line very faint, with scarcely any dark filling-in; dark apical streak moderately conspicuous. Hindwing whitish, tinged with sand-colour, especially at distal margin; fringes sand-colour, very weakly chequered. Under surface strongly and pretty uniformly irrorated with sand-colour. Rather broader-winged, less glossy and more sharply marked than *nebulata* B.-Haas. Lebanon (Mrs. Nicholl). Type in the British Museum.

O. pinnaria *Chr.* is diagnosed as near *junctata* *Stgr.*, which it closely resembles in colour and pattern. The proximal of the two lines nearly straight, gently crenulate, the distal acutely angled and dentate, the space between them more or less filled in with fuscous; subterminal line moderately distinct, dentate. Median line of hindwing angled, obscure, fuscous. ♀ paler. Length of a forewing 13–16 mm. Taken above Kurusch (Transcaucasia) in moist mountain pastures at the end of July and beginning of August.

O. junctata *Stgr.* (7g) was considered by its author to be near *bipunctaria* and *vicinaria*, but if the species which today passes under the name of *junctata* is correctly determined the resemblance is not at all close. It is narrower-winged, more glossy and appears rather more slenderly built, while the tone of colour is more brownish; the aspect, on this account and also because the edges (especially the distal edge) of the median band are very strongly and irregularly lunulate-dentate, is scarcely that of an *Ortholitha*. The median band is, as is usual in the genus, pale in its central part and contains a rather thick, elongate discal mark (thickest anteriorly) which according to STAUDINGER is never broken up into 2 dots; in the only ♀ before me however, this is distinctly the case, and they are much reduced in size. Hindwing and under surface weakly marked or without markings. The ♀ is smaller than the ♂. Distributed in Central Asia, flying from the end of June to the end of July. — **microgynaria** *Hmps.*, from the N. W. Himalayas, appears to me to be a still narrower-winged, rather greyer form of *junctata* with the discal mark frequently (especially in the ♀) much reduced. The ♀♀ in this form are still smaller than in typical *junctata*. June to September.

O. perplexaria *Stgr.* is unknown to me. According to STAUDINGER's description and figure it is not a typical *Ortholitha*, inasmuch as the costal margin of the hindwing is scarcely produced. Forewing light, whitish grey, the edges of the dark median band formed nearly as in *junctata*, but the proximal edge with a strong indentation in the cell which is not shown in that species. Subterminal line white, undulate, proximally (especially in the anterior part) accompanied by a dark shade. Hindwing whitish grey (lighter and more nearly markingless than in *vicinaria* and *subvicinaria*), with faint darker and lighter transverse lines in the distal half. Forewing beneath somewhat brownish grey, with a narrow, very indistinct lighter band in its distal part, containing a weak darker line in its centre. Hindwing beneath with a dark discal lunule and obscure dark distal band. Only known from the South-western Caucasus, where it was discovered by CHRISTOPH in July.

O. bipunctaria *Schiff.* (= *undulata* *Sc. nec L.*) (6h) is one of the commonest and best-known of the European species, but is always interesting on account of its great variability. This is in large measure dependent on the nature of the rocks or soil on which it rests. The name-type, as described by SCOPOLI (*bipunctaria* was given as *nom. nov.*, to avoid homonymy with *undulata* *L.*), is at the same time the commonest form, with the ground-colour cinereous, the median band mixed with fuscous, the discal dots seated on a pale central space. As there is no known species with which *bipunctaria* can be confused, a detailed description is unnecessary. The ♀♀ are on an average paler than the ♂♂, especially in the chalk-frequenting forms, in which no doubt the more perfect protective adaptation of the ♀ is an advantage to the species. In general these chalk forms can be distinguished by their whiter ground-colour, but I find no sufficiently sharp distinction to justify a varietal name. — ab. **fasciata** *ab. nov.* may, however, be employed for a pretty and rare form in which the ground-colour is almost pure white and the central band strongly darkened. The specimen figured as *herberti* (6i) — an unnecessary name — is intermediate towards ab. *gachtaria*. — In ab. **obliterata** *ab. nov.*, on the contrary (see BARRETT, *Lep. Brit. Isl.* vol. 9, pl. 379, f. 1e) the ordinary markings are almost completely suppressed. — ab. **reversa** *ab. nov.* is a very extraordinary form in which the basal and median bands are grey or whitish while the rest of the forewing is almost black. BARRETT mentions one from Box Hill in coll. ADKIN and I have seen a second example, also English. — ab. **griseszens** *Neuburger*, described from Digne, is entirely without brown dusting in the median and distal areas, thus of a uniform clear grey tone. My

own specimens from Digne certainly suggest a local race in their peculiar sandy grey tone (scarcely "clear grey") and weakly expressed central band. — ab. *gachtaria* *Frr.* has the ground-colour darker grey and the markings correspondingly darkened. — *maritima* *Seeb.* is a much more extreme form, almost uniformly infuscated (blackish), or at least strongly infuscated and with the bands blackish. It forms a local race at Bilbao, but occurs elsewhere as an aberration. — *sandalica* *Schawerda* is lighter, cleaner bluish-grey, not brownish nor darkened, the postmedian dark band more strongly and sharply dentate. Herzegovina. Possibly a form of the following species? — Larva rather stout, flattened, with the setae strongly developed; variable in colour, whitish-ochreous or slate-colour, etc., ventral surface conspicuously striped. On various Papilionaceae. Pupa elongate, smooth, dull red, in a slight cocoon on the surface of the ground. Imago in July and August, easily disturbed by day but flying at dusk or especially later in the night, when it freely visits flowers and occasionally "sugar".

octodurensis. **O. octodurensis** *Favre*. Closely similar to *bipunctaria* but larger and more robust, the median band somewhat differently formed, with stronger distal projections, the two dark discal dots not so sharply separated as in *bipunctaria*. The colouring of the upper surface varies between blue-grey (according to FAVRE "violaceous brown") and brown-grey. On the underside the costal margin and apical part of the forewing are strongly shaded with yellowish. July—August. Described from Valais but PÜNGELER — on whose authority *octodurensis* has been raised to the rank of a species — possesses a somewhat lighter form from Digne. FAVRE described it as a variety of *bipunctaria* though expressing the surmise that it might well be a species. WULLSCHLEGEL suspects that the larva feeds on *Ononis natrix*. *octodurensis* is unknown to me in nature.

alfacaria. **O. alfacaria** *Stgr.* (= *nevadaria* *Rbr.*). In my opinion BOHATSCH, PÜNGELER and RIBBE are right in referring this species to *Ortholitha*. ♂ antennal pectinations rather longer than in *bipunctaria*, to which it is perhaps related. Wings rather elongate. Forewing dark brown-grey, with paler and darker waved lines; median band little darkened, its central part remaining of the ground-colour; discal mark elongate. Hindwing markingless, excepting a discal dot, which is also present beneath. Flies in the Sierra Nevada in July—August. PÜNGELER (in litt.) says that he has a lighter form from the Sierra Espuña.

alpherakii. **O. alpherakii** *Ersch.* (11a) is recognizable by its very glossy wings and the weakness of its markings. It may perhaps best be compared with some weakly-marked aberrations of *plumbaria*, to which it shows some approach in its leaden-grey shade of colour. It is, however, slightly narrower-winged, more glossy, with a more elongate (or almost double) discal mark and has no real dark transverse lines, the somewhat greyer median area being merely separated from somewhat more ferruginous subbasal and submarginal bands by very fine, indistinct wavy whitish lines. Hindwing and under surface unmarked. Only known from the North-eastern Caucasus. Two examples from the ZELLER collection bear the manuscript name of *schistaceata* *Z.*

nebulata. **O. nebulata** *B.-Haas*, described from Aintab (Asia Minor), is said to be related to *alpherakii* but quite different in colour. Forewing pale yellowish brown with the median area somewhat lighter, mixed with grey, bounded by thick clay-yellow lines or stripes; discal dot also clay-yellow; basal and distal areas without markings. Hindwing markingless, somewhat paler than forewing. Underside also paler and markingless. Antennal pectinations of about the same length as in *alpherakii*. According to the figure slenderly built. Some glossy, rather narrow-winged examples before me labelled "Syria" may probably belong here.

B. ♂ antenna simple.

pulchrata. **O. pulchrata** *Alph.* (= *cometifera* *Warr.*, described as *Kuldscha*) (8 °c). This species certainly has nothing to do with *Scotosia*, to which ALPHÉRAKY referred it, while the wingshape and the discocellulars of the hindwing separate it from *Kuldscha*. Except that the palpus is rather short, the ♀ agrees entirely with *Ortholitha*; the ♂ antenna is simple also in one or two African species which I have referred to *Ortholitha* (*Onychia*) and PÜNGELER has proposed transferring here the three species described below. *pulchrata* is variable in colour, forewing lighter or darker brown, but is easy to recognize by the form of the markings, which are correctly shown in our figure; often the dark line distally to the central band is marked with strong black spots on the veins. Hindwing whitish or in darker specimens pale brown-grey with whitish postmedian line or band, whitish subterminal and small black discal dot. Distributed in the Thian-shan district. WARREN's type was received from a dealer and the locality "Amur" doubtless erroneous.

adornata. **O. adornata** *Stgr.* is unknown to me but is evidently near *pulchrata* with which, according to its author, it altogether agrees in form and structure and in colour. The scheme of markings is also similar but it can be distinguished at once by their being much straighter. The middle of the central area of the forewing forms

a rather broad pale band, containing the discal mark; its narrow proximal and broader distal parts according to the figure darker than in any *pulchrata* which I have seen. Hindwing as in *pulchrata*. Koko-Nor, Tibet.

O. latifusata Walk. (= *naemata* Feld.) and its close ally *niphonica* stand somewhat apart from all other *latifusata*. known species, but I think PÜNGELER has found the best position for them, at least provisionally. The shape, gloss and pattern of the forewing agree well with *Ortholitha*; the hindwing has the costal margin scarcely so elongate as in most of the species and *latifusata* is also aberrant in having the discocellulars more or less angulated, on account of an inward curve in the second discocellular. *latifusata* has the forewing proximally and especially medially of a duller, slightly darker, less purplish brown than the here figured *ignotata*, the distal area in the ♂ nearly as dark as the median, in the ♀ largely whitish, at least proximally; the projection in the postmedian is perhaps on an average more strongly rounded. Hindwing grey with wavy white lines beyond the middle. N. W. Himalayas and many localities in W. China.

O. niphonica Btlr. (= *suavata* Chr.) (7 e) has the discocellulars normal, oblique, the basal and median areas *niphonica*. of the forewing usually more reddish brown, the latter darkening distally, the distal area lighter yellowish brown, usually becoming paler distally. Hindwing rather darker than in *latifusata*, with a generally more conspicuous black discal dot and angulated postmedian line, the latter usually accompanied distally by a single fine whitish line. No marked sexual dimorphism. Japan, Amur and N. India. — **ignotata** Stgr. (= *ignorata* *ignotata*. Stgr., nom. praeocc.) (8 i) from Koko-Nor probably belongs here, as the sexes are nearly alike; the curve in the postmedian is, however, broader and rounder and STAUDINGER's type had the forewing dark grey-brown, distally light violet grey, hindwing grey, weakly marked.

7. Genus: **Kuldscha** Alph.

Essential characters nearly as in *Larentia*, distinguished chiefly by the wing-shape, the hindwing in particular being more strongly produced at the apex, sometimes almost pointed, the distal margin not crenulate. From *Kyrtolitha* it differs in the pectinate ♂ antenna, from *Ortholitha* in the biangulate discocellulars of the hindwing. Only a few Asiatic species are yet known.

K. staudingeri Alph. (7 e), the type of the genus and the most characteristic species, recalls *Kyrtolitha staudingeri*. *obstinata* in the extremely irregularly-formed lines which limit the rather narrow central area of the forewing. The ground-colour is pale cinereous with a slight tinge of brown, the basal and median areas and some ill-defined shades proximally and distally to the median darker and browner; the zigzag lines which bound the basal and median areas are sharply defined, blackish. Hindwing whitish cinereous proximally, somewhat more brownish distally, with a black discal dot, a sinuous postmedian line and usually some more feebly expressed lines beyond. Fringes of both wings dark-chequered. Discovered in the forests of pine (*Picea schrenckiana*) along the Kungess in the first half of June, at elevations of 4000—7000 feet. Known only from the Western Thian-shan and Issyk-Kul districts.

K. oberthuri Alph. (11 a) differs in being rather more uniform in colour, the margins of the central *oberthuri*. band much less irregular, the band itself rather broader, containing a conspicuous black discal dot and also a thick curved black mark on the 3rd radial vein from the end of the cell to the postmedian line. The Amdo district (Myn-dyn-scha) is the only recorded locality, but the specimen which we figure (ex coll. Brit. Mus.) is labelled Koko-Nor and the British Museum also possesses a small worn ♀ from Yatung (Tibet) which seems referable here.

K. lakearia Ob. (6 i) closely resembles *oberthuri*, which may possibly even be a form of it. *lakearia*, *lakearia*. however, seems to be rather smaller, rather darker, more strongly marked (especially on the hindwing) and with the postmedian line on both wings making a stronger projection behind the 3rd radial vein. The median band is of a somewhat more reddish brown. In the ♂ of *lakearia*, moreover, the distal margin of the hindwing is rather more rounded than in that of *oberthuri*. Inhabits Western China (Ta-chien-lu, Pu-tsu-fong).

K. productaria Leech (described as *Oporabia*) agrees entirely with *Kuldscha* in structure except that *productaria*. the antennal pectinations are longer; all the margins of the forewing are slightly more rounded and the distal margin of the hindwing is likewise more rounded in its anal half. Altogether a duller insect, the wings being

more thinly scaled, the fuscous forewing much more weakly marked; basal area a little darkened, followed by a weakly bisected whitish band, which is marked with distinct dark dots on the median and submedian veins; median band rather broader than in *staudingeri*, somewhat darkened but very ill-defined, much less irregularly shaped than in that species, the pale areas which limit it chiefly marked costally and on the veins, where pairs of whitish dots enclose single dark dots; distal area also with the veins alternately light and dark-marked, an indistinct pale subterminal line present. Hindwing rather more whitish towards base than in normal *staudingeri*, the discal dot and postmedian line fainter. Forewing beneath almost uniform fuscous, hindwing more whitish, with traces of darker postmedian line; both wings with distinct cell-spot. Ta-chien-lu, W. China, only the type (σ^7) known.

8. Genus: **Mesotype** Hbn.

Habitus and most characters as in *Ortholitha*, of which GUENEE made it a section. Face less oblique, antenna in σ^7 simply ciliated, not pectinated, forewing with the distal wall of the outer areole usually obsolete as in *Cataclysmes*, the 5th subcostal long-stalked with the 1st radial and widely separated from the other subcostals. The only known species is of smaller size than the smallest *Ortholitha*.

Widely distributed in the Palearctic Region.

virgata. **M. virgata** Hufn. (= *lineolata* Schiff.) (6c). Light grey to whitish, more or less dusted with brownish, forewing with the lines dark brown; subbasal, antemedian and postmedian nearly straight, the latter followed by 2 or 3 slightly less straight lines; antemedian accompanied proximally and postmedian distally by a whitish line; discal dot black; an oblique subapical streak present, as in *Ortholitha*, the pale subterminal line nearly straight. Hindwing with 2 or 3 brownish lines. Variable in ground-colour and in the median area of the forewing, which is sometimes merely marked with a few fine straight lines, at other times strongly dark-shaded at each side, but almost always shows a slender pale line in the middle; really striking aberrations, however, are rather rare. The φ is rather smaller and narrower-winged than the σ^7 . — ab. **impunctata** *Petersen* lacks the black discal dot of the forewing. — Larva slender, somewhat flattened anteriorly and posteriorly; very variable in colour dorsally, dull pink, brown or olivaceous with dark brown or blackish-green mediodorsal line, thin, interrupted subdorsal line, two dark stripes (the lower almost black) between the subdorsal and the spiracles; ventral surface pale yellow. Feeds on *Galium*, especially on sandhills. Pupa rather short and stout, thoracic part strongly rounded, glossy; dark red-brown, abdominal divisions bright light brown. The moth appears in a succession of broods and is widely distributed from Central Europe to Amur and locally abundant.

9. Genus: **Hastina** Moore.

Face smooth, not protuberant. Palpus quite short, smooth-scaled. Antenna in σ^7 nearly simple, minutely ciliated. Leg-structure normal. Forewing with distal margin excised between the apex and 3rd radial, often slightly also behind 1st median, thus very prominent in the middle; areole single, 1st—4th subcostal stalked from apex of areole, 5th subcostal arising about from apex of areole. Hindwing with distal margin very strongly dentate at the vein-ends, with the longest teeth at the 1st and 3rd radials and the deepest excision between them; discocellulars oblique, 2nd radial arising above their middle.

An eccentric genus in shape, but otherwise closely allied to the *Asthena* group. I as not know on what grounds STAUDINGER has placed it in the present position. The species are chiefly Indian. Dr. SEITZ informs me that the resting posture resembles that of the Epiplemid.

subfalcaria. **H. subfalcaria** Chr. Dark brown, slightly mixed with yellowish. Both wings with 2 dentate bluish-white lines, the proximal beginning pretty exactly in the middle of the costa of the forewing, the distal at beyond three-fourths, both becoming less distinct posteriorly; the median area, especially at the costa, some-

what darkened, suggesting a central band; forewing costally also with a bluish-white subterminal line, which disappears about at the 3rd radial. I have not seen the Palearctic form, which was taken in Amurland in July. The Indian representative is — *caeruleolineata* Moore, possibly, as STAUDINGER suggests, a separate species, but I hardly think so. Except that the distal margins seen moore deeply excised no difference is mentioned. The median band is not appreciably darkened. I introduce it here because WILEMAN has recorded it from Japan, but I suspect his specimen will prove to be *subfalcaria*.

*caeruleo-
lineata.*

H. azela Btlr. (Vol. 2, pl. 48 i). Rather larger than *subfalcaria*, the distal margin of the forewing somewhat less deeply excised. Entirely different in coloration, the dark brown ground-colour being less uniform and much more restricted, an extended apical area on the forewing and marginal band on the hindwing being white, while the posterior part of the median area of the forewing and nearly the proximal half of the hindwing are light buff-colour; the dark areas are traversed by some vague bluish-silvery lines and the forewing shows also 2 or 3 undulate rust-coloured lines; the white apical patch of the forewing is continued narrowly to the hinder angle, herein differing from the nearly allied Indian species *gemmifera* Moore. Only known from Japan.

azela.

10. Genus: *Minoa* Tr.

Face smooth. Palpus short, lessely scaled. Antenna in ♂ shortly ciliated. Leg-structure normal. Wings glossy, smooth-margined. Forewing with areole double, 1st subcostal arising from anterior margin of outer areole, or exceptionally from its apex. Hindwing with discocellulars oblique, not biangulate.

Only a single species is known. Like the preceding genus, it probably belongs in the vicinity of *Asthena*, to which MEYRICK has sunk it. It differs in the point of origin of the 1st subcostal vein of the forewing as well as in facies.

M. murinata Sc. (= *sordiana* L. = *fuscata* Hufn. = *euphorbiata* Schiff. = *unicolorata* Hbn.) (6 c). Very variable in colour, in almost all the forms entirely without markings, but easily recognized by its shape and by the structural characters; in size it varies comparatively little. The typical form (at least in the ♂) is, as the name implies, mouse-coloured or inclining to fuscous; the ♀, however, is almost always more yellowish-tinged than in the corresponding ♂ form. — ab. *italicata* Mill. is a rare aberration, of typical ♀ coloration, in which 2 or 3 faintly darker lines are visible in the distal half of the forewing or of both wings, faintly crenulate and parallel with the distal margin, slightly recalling certain *Euchoeca obliterata*. Described from a single ♀ from Italy, but the only specimen before me is a ♂ from the ZELLER collection, probably from Silesia. — *amylaria* Lah. (= *cinerearia* Stgr.) is a whitish-ashy form which occurs chiefly in mountain localities and may be regarded as the prevailing race in some parts of the Alps. My own most extreme examples are from Fusio. STAUDINGER also records it from Saxony and the mountains of Central Italy. — *cyparissaria* Mann (6 c) is the antithesis of the preceding, the colour being deep leaden grey, almost black. It occurs in several localities in the South of Europe and about Sarepta, sometimes as an aberration, sometimes as a local race; and the only two specimens which I have seen from Japan belong to this form. — *monochroaria* H.-Sch. is a bright ochreous form (sometimes, indeed, as brightly coloured as *Cleogene lutearia*, and tends to replace the type in parts of Eastern Europe, Asia Minor, Central Asia and E. Siberia. Perhaps chiefly a summer form. — The larva is short and thick, rugose dorsally, the head small; probably variable in colour and markings, as the accounts differ; according to BUCKLER red-brown dorsally, with oblique black bars running from a fine white mediodorsal line to a black spiracular one, beneath which runs a broad reddish-yellow stripe. Feeds exclusively on species of Euphorbia. The pupa is short and thick, brown in colour, enclosed in a cocoon on the surface of the ground and hibernating. The moth appears in May and June and again — especially in southern localities — about August. It flies in the sunshine in wood-clearings often at a good height above the ground.

murinata.

italicata.

amylaria.

cyparissaria.

monochroaria.

11. Genus: *Amygdaloptera* Gmpbg.

Face prominent, somewhat roughened. Palpus moderate, rough-scaled. Antenna in ♂ unipectinate. Leg-structure normal. Forewing amygdaloid; areole double. Hindwing with distal margin entire; costal vein not anastomosing with the cell, but connected by a bar near its apex; discocellulars oblique, not biangulate; inner-marginal area in the ♂ modified so as to form a small pocket on the under surface near the base.

The sole species is confined to North Africa. It differs from all other Palearctic Larentiids in the uniseriate pectinations of the ♂ antenna, an extremely rare occurrence in this subfamily, though found also in a few American genera (*Monotaxis*, *Nomenia*, *Cophocerotis*). The structure of the hindwing associates *Amygdaloptera* unmistakably with the *Chesias* group.

testaria.

A. testaria *F.* (= *duponchellaria* *Luc.*) (6 a). Forewing almost uniform testaceous brown, hindwing uniform fulvous. The sexes differ somewhat in size and shape, but I know of no other material variation in the species. It is apparently by no means rare in Algeria.

12. Genus: **Stamnodes** *Guen.*

Face smooth or nearly smooth, rounded, sometimes a little prominent. Palpes short or quite moderate, shortly scaled. ♂ antenna simple, flattened. Leg-structure normal. Forewing usually rather narrow, distal margin smooth; areole double. Hindwing rather elongate, distal margin smooth, rounded, inner-marginal area somewhat narrowed, with the submedian (vein 1 b) close to the margin, which is usually slightly folded, but not developing a distinct pocket; discocellulars biangulate.

A not very extensive genus, inhabiting Palearctic Asia and America. Although presenting few salient characters it is generally easy to recognize by its facies, which is different from that of most Larentiids. The wings are of rather delicate texture, usually of a yellow colour and with more or less complete dark distal bordering which widens at the apex of the forewing. The other markings consist of dark spots or blotches, especially at the costal margin of the forewing.

pauperaria.

S. pauperaria *Ev.* (= *passerinaria* *H.-Sch.*) (6 a), the type of the genus, is of a light fulvous ochreous, paler towards the margins, especially the costal margin of the forewing. The markings are formed of massed fuscous atoms, which do not entirely obliterate the yellow of the ground-colour; the marginal band is complete, though very narrow, the apical patch moderately extended; costal margin with 3 further (rather vague) blotches, the first 2 only reaching the subcostal vein, the 3rd narrowly and indefinitely extended as far as the 3rd radial or 1st median. Underside of forewing similar to upper, the fuscous dusting more extended in the basal area; hindwing beneath whitish, densely spotted and strigulated with fuscous throughout, with the exception of a curved central fascia. Widely distributed in Central Asia. — **divitiaria** *Stgr.* is a form with the anteapical patch (half-band) on the forewing and the entire under surface of the hindwing deeper fuscous. It is the principal, though not the only form in the Ala Tau and is also recorded from the Karategin district, Buchar.

pamphilata.

S. pamphilata *Feld.*, from Koksar, Kulu, Dharmasala, etc., represents *pauperaria* in the N. W. Himalayas and might possibly be regarded as a form of it. The fuscous markings are darker, not or scarcely sprinkled with a dusting of the ground-colour, the third costal blotch of the forewing is much better defined and of more uniform width, only narrowing quite slightly posteriorly, and the base of the forewing to nearly one-half and of the hindwing to beyond one-half is suffused with fuscous. The under surface shows similar distinctions.

danilovi.

S. danilovi *Ersch.* (= *dauidaria* *Ob.*) (6 a, b) is a very distinct species, with rather broader wings, of a brighter colour, the fuscous markings broken up into series of sharply-defined spots, the hindwing (especially beneath) copiously dark-spotted, the abdomen also dark-spotted. Distributed in Southern Siberia and Northern China.

depeculata.

S. depeculata *Led.* I do not know the name-type of this species, which occurs only in Transcaucasia. It is described as having the forewing dark grey with a narrow white band at about three-fourth, strongly excurved in the middle, and with two other bands more or less indicated, one from the costa at one-fourth, the other at one-half, sometimes joining in the middle of the wing (becoming obsolete in the figured specimen); fringe chequered. Hindwing white, finely dusted with grey, especially towards the distal margin; beneath very coarsely scaled with dark grey and dirty white ground (the figure shows a narrow white median band). —

narzanica.

narzanica *Alph.* (= *tibetaria* *Ob.*) (6 b) differs in having the ground-colour white, the dark parts of the forewing being restricted to some weak basal shading, two costal marks in the proximal half, an incomplete fascia running from the costa beyond the middle and a marginal band which widens at the apex, occasionally in part confluent with the submarginal; hindwing also white excepting a narrow distal border, which is sometimes reduced to a mere marginal line. Said to occur as an aberration in Transcaucasia, but also inhabits the Northern Caucasus, the Koko-Nor district and W. China.

13. Genus: **Polythrena** *Guen.*

Face smooth, slightly rounded. Palpus rather short, somewhat rough-scaled. Antenna in ♂ nearly simple, minutely ciliated. Leg-structure normal. Wings rather narrow with the apices rounded and the distal margin smooth. Forewing with areole simple; ♂ with a pencil of long black hairs beneath, arising near the base of the posterior margin. Hindwing with the costal vein anastomosing with the cell, but more shortly than in most of the Larentiids; discocellulars biangulate.

A very natural genus, consisting of three closely allied species which inhabit Siberia and Western China.

P. coloraria *H.-Sch.* (= *melanicterata* *Led.*) (11b). Bright golden-yellow, with irregular, broad, angulated black markings, which vary somewhat in extent, but of which the general form may be seen from our figure. Median band on both wings not interrupted; apical band extending as far as the first median vein, though becoming very narrow; blotches at hinder angle rather large. Apparently a rare species, only known from the Altai and Eastern Siberia, flying by day at high altitudes. *coloraria.*

P. miegata *Pouj.* (11b) differs from *coloraria* in having the median band more distally placed, interrupted in the middle, the marginal band broken into three parts instead of two, the apical part not reaching beyond the 3rd radial, a second patch commencing between this vein and the 1st median and extending to the 2nd median, and a (usually rather small) third patch occupying the hinder angle of the wing. W. China (Mou-pin and Pu-tsu-fong) at elevations of over 3000 m, June and July. *miegata.*

P. angularia *Leech* (11b) resembles *miegata* (of which *POUJADE* considered it a variety) in the interrupted median band, but differs essentially in the distal markings, which consist of a broader and more extended apical band and a much larger tornal blotch, sometimes (as in *LEECH*'s type ♂, which we figure) narrowly connected along the distal margin. The markings in the basal part of the forewing and the inner-marginal part of the hindwing are also very different and the fringes are more chequered. Finally, the ♂ has a narrower hindwing, its distal margin being slightly concave from the anal angle to the middle. W. China, together with *miegata* and at Ta-chien-lu and Omei-shan. *angularia.*

14. Genus: **Trichobaptria** *gen. nov.*

Agrees with *Polythrena* in almost all characters, but the areole of the forewing is double. Superficially it also differs in the scheme of coloration, which agrees with that of the succeeding genera. The ♀ differs little from that of *Baptria* except in the narrower wings and the shorter anastomosis of the costal vein of the hindwing; the ♂ is further distinguished by the presence of the long black hair-pencil on the forewing beneath. The type of the genus and the only known species is *exsecuta*, from Japan.

T. exsecuta *Feld.* (6c as *kindermanni*). Forewing black, with a very fine white antemedian line from the costa to the middle of the wing and a narrow oblique white band from just beyond the middle of the costa to the 1st median vein or somewhat beyond; often also there is a fine line, usually more or less interrupted, running from the posterior part of this band to the hindmargin, parallel with the distal margin. Hindwing with a single white line or narrow band, continuing the last-mentioned line of the forewing; costal area in the ♂ white or whitish. Both wings with the fringe white at the apex and between the 1st median vein and the submedian fold (variably in exact extent), otherwise black. Very variable in the width of the white bands; the fine antemedian line of the forewing and even the median line of the hindwing are sometimes entirely obsolete, or represented only by one or two white spots. — ab. *latifasciaria* *Leech* is on an average smaller, but is chiefly distinguished by having on both wings a broad white postmedian (median) band, that of the forewing rather longer than in the type-form (sometimes almost reaching the distal margin), that of the hindwing usually with an angular projection in its distal edge. — ab. *obscurior* *Th.-Mieg* only differs from the type in the absence of the white band on the forewing above. Described from Japan. — *exsecuta* is apparently common in Japan (as at Ohoyama, Nikko, Yezo, etc.) and is active on the wing by day, July-August. *LEECH* also records having taken it at Gensan, but I have seen no Korean examples. *exsecuta.* *latifasciaria.* *obscurior.*

15. Genus: **Trichodezia** *Warr.*

Closely related to the two preceding genera, agreeing with *Polythrena* in the neuration of the forewing, with *Trichobaptria* in coloration. From both it differs in the neuration of the hindwing; the discocellulars are simply oblique, not biangulate, and the costal vein anastomoses with the subcostal nearly to the end of the cell, which is very short. The hair-pencil on the hindwing beneath is not so long as in those genera; indeed in the North American *albovittata* *Guen.*, which *WARREN* selected as the type of the genus, it is comparatively ill-developed.

The genus contains only a few Asiatic and North American species.

haberhaueri.

T. haberhaueri *Led.* (7f) is perhaps only a western form of the following species. Typical *haberhaueri* differs markedly from typical *kindermanni* in having the white markings more extended, especially on the hindwing; this wing in *haberhaueri* shows on the upper surface a small white patch placed just outside the discal spot and a moderately broad, irregularly shaped postmedian band which becomes very narrow towards the inner margin; and on the under surface an extended white basal area separated only from the postmedian band by a narrow dark stripe. Both species, however, show forms which are much more difficult to differentiate, though the postmedian band of the forewing in *haberhaueri*, besides two fine white lines nearer the base, seems to be more strongly bent outwards in the middle, oftener interrupted and altogether more irregular in its course; proximal margin of the postmedian band on both wings more dentate. From *Trichobaptia exsecuta*, apart from the structural characters, *haberhaueri* differs in the absence of the white costal margin of the ♂ hindwing and in its regularly black-and-white-chequered fringes, especially of the hindwing. Described from the mountains of Abbastuman, in the Imeritia district of Transcaucasia. The specimens before me are from Achalzich (Akhaltsikh). — **ledereri** *Stgr.*, from Borjom, is a much darker race with the white markings more slender, in part obsolete. I have not seen it, but it must be very similar to typical *kindermanni*.

kindermanni.

T. kindermanni *Brem.* (7b). Black, generally deeper and less brownish-tinged than in *haberhaueri*. Forewing with one or two fine white, slightly bent lines in the proximal half (which, however, are sometimes partly or entirely obsolete) and an oblique white band from the costa beyond the middle, varying in width and sometimes continued by a fine, slightly curved line to the posterior margin; often also one or two submarginal white dots in the posterior half of the wing. Hindwing usually with a slender white band or line from the inner margin, which rarely reaches as far as the costal margin, but sometimes widens in the middle of the wing. Fringes as in *haberhaueri*. — **leechi** *Stgr.* (7b) has the oblique white band of the forewing narrowed, not continued to the posterior margin, that of the hindwing reduced to a more thread, often interrupted or even entirely wanting; the proximal white lines and the submarginal white dots of the forewing usually altogether obsolete, the fringes more blackened. Only recorded from Japan. — **latifasciaria** *ab. nov.* shows the opposite extreme, the white markings being considerably extended. Postmedian band of forewing as broad as in typical *Baptia tibiale*, both the antemedian lines distinct, submarginal dots somewhat enlarged; hindwing also with a broad white postmedian band, its proximal edge nearly straight, its distal very strongly projecting in the middle, where it becomes even wider than the corresponding band of *exsecuta* *ab. latifasciaria*. Hakodate, 3 examples in the LEECH collection; a Yezo specimen mentioned by LEECH, and perhaps still more extreme, is not traceable. A single example from Ta-chien-lu, W. China, with the hindwing white from the postmedian band almost to the base (except a large black discal spot) perhaps represents a local race. — *kindermanni* inhabits Eastern Siberia and Japan and is on the wing in June and July.

16. Genus: **Baptia** *Hbn.*

Face appressed scaled. Palpus short. Antenna in ♂ slightly thickened, minutely ciliated. Leg-structure normal. Wings moderately broad, apices rounded, distal margin smooth. Forewing with areole double, no hair-pencil beneath. Hindwing with costal anastomosing with subcostal nearly to the end of the cell, discocellulars moderately (sometimes only weakly) biangulate, 2nd radial arising scarcely below their middle.

Only a single species is known, which is very local in Europe and Palearctic Asia. It does not differ very markedly in structure from the later Larentiid genera, but has evidently the closest affinity with *Trichobaptia*. The older systematists confused it, on account of its black colouring, with *Odezia* and STAUDINGER has allowed this error to remain uncorrected, although the two do not even belong to the same subfamily. MEYRICK refers *tibiale* to *Eustroma*, which is characterized by the presence of the hair-pencil on the forewing; it appears therefore that he must have had *exsecuta* before him and not the true *tibiale*.

tibiale.

B. tibiale is on an average larger than the hitherto described black-and-white species and is nearly always further distinguishable at a glance by the uniformly white fringes. Three principal races are recorded, but there is so much individual variation in some localities that I am not sure whether they should not rather be reduced to the rank of aberrations. — **tibiale** *Esp.* (= *dimidiata* *Hbn.*, nec *Hufn.* = *aethiopata* *Heinem.*, nec *Scop.*) (6c) has a moderately broad white band on the forewing but no band on the upperside of the hindwing. It occurs very locally in Central Europe (Piedmont to Galicia) and more commonly in Eastern Siberia, Korea and Japan. — **aterrima** *Btlr.*, from Japan, has the band considerably narrowed, though still retaining the leg-and-foot shape of that of the type. It forms a transition to the following race. —

moeroraria.

moeroraria *Frr.* (6c) has the band further reduced into a narrow streak, running to a point at the posterior

end. It was discovered in damp places in the forests of the Ural and has since been recorded from the Altai and the Issyk-Kul district. — *eversmannaria* H.-Sch. has the band of the forewing widened and shows also a narrow, or even rather wide, white band on the upperside of the hindwing, whereas in typical *tibiale* this latter is confined to the underside, and always quite narrow. Chiefly characteristic of more northerly localities, but also occurring in the South as an aberration; Scandinavia (very scarce and local), Sajan, Amurland (chiefly in the north), Japan etc. — ab. *decisata* Walk. is a slight modification of *eversmannaria*, the band of the forewing remaining rather narrow while that of the hindwing is also present. The locality for WALKER's type was unknown, but similar examples occur occasionally in Japan. — The egg is light green, somewhat oval, flattened. The larva is somewhat narrowed anteriorly, somewhat flattened, with prominent lateral folds; green with yellow incisions and broad brown-red dorsal line, in part interrupted, in part widened into roundish or heart-shaped markings. It feeds on *Actaea spicata* in August, in damp places in woods. The pupa is compact, brown, abdomen more yellowish, cremaster with two strongly divergent points; in an earthen cocoon. The moth appears in June and July; it is very shy and flies high.

17. Genus: *Schistostege* Hbn.

Face rather prominent. Palpus moderate, rough-scaled. Antenna in ♂ ciliated. Foretibia without apical hook. Hindtibia with all spurs present. Forewing with areole double. Hindwing with costal margin very long, the wing being produced to a point at the end of the 2nd subcostal vein; costal merely appressed closely to subcostal, not anastomosing, but connected with it by a bar near the end of the cell; ♂ with submedian vein wanting, the basal part of the inner-marginal area being folded so as to form a small pocket beneath, much as in the following genera though less highly developed.

Only two species are known, both Palearctic. Easily distinguished from the following genera by the shape of the hindwing.

S. decussata Schiff. (6d). White, more or less dusted with fuscous, all the veins fuscous; both wings near the distal margin with a clearer white narrow band, bordered on each side with fuscous, strongly outbent between the 2nd radial and 2nd median; fringes chequered white and fuscous. Forewing beneath more infuscated than above. Local in Southeast Europe, said to fly by day in damp meadows. — ab. *fortificata* Tr. is a frequent form in Hungary and has entirely supplanted the type in the neighbourhood of Buda-Pesth. It is more or less uniformly suffused with lighter brownish. The white part of the fringes, however, and often the subterminal band also, remains free from the suffusion. — ab. *infumata* Th.-Mieg is the extreme development of the *fortificata* form, the wings being darker smoky and absolutely unicolorous. — The early stages have recently been described by SPRIZ, who found the larvae in May on a *Euphorbia*. Larva grass-green, tapering anteriorly, skin transversely folded, a strong lateral ridge, tubercles brownish, ringed with light yellow, setae fine; lateral stripe yellow; venter with 3 fine, mostly light yellow stripes; head round, smaller than prothorax, face slightly flattened. Pupa rather glossy brown, wings somewhat lighter; leg- and tongue-case projecting; cremaster with 2 points. The moth appears after about 3 weeks.

S. nubilaria Hb. (6d). Paler than the preceding, the upper surface without the darkened veins and borders to the subterminal band, the band itself less strongly outbent in the middle; fringes less strongly chequered. The ♀ is smaller and narrower-winged than the ♂. — *exalbata* Hb. (6d) is still paler, the upper surface being of an almost unicolorous dirty white, the subterminal band (at least on the forewing) faintly indicated in purer white. Forms a local race about Sarepta, but occurs with the type in some other localities. — *knüpfperi* Huene from Krasnoufmsk, E. Russia, is said to be darker, more reddish grey than the type and with the fringes more strongly chequered. — *nubilaria* inhabits Roumania, S. E. Russia and the mountains of Central Asia as far as Mongolia. Flies on the steppes in June.

18. Genus: *Lithostege* Hbn.

Face with obtuse prominence. Palpus moderate, rough-scaled. Antenna in ♂ somewhat thickened minutely ciliated. Forefemur much thickened; foretibia extraordinarily short, ending in a broad, horny plate, from which project a long, strong inner claw, a very short outer one and usually a point in the middle. Hindtibia with all spurs. Abdomen obtuse at extremity. Forewing with areole double. Hindwing narrow, its apex rounded, much less produced than in *Schistostege*; costal vein occasionally as in *Schistostege*, but more commonly anastomosing either at a point near the end of cell or more strongly, 3rd radial and 1st median

usually arising well separate, occasionally (*excelsata* and *staudingeri*) stalked; ♂ with submedian wanting, 2nd median running to the middle of inner margin, a membranous pocket on underside of inner margin near base. The ♀ is in general smaller and narrower-winged than the ♂.

The earlier stages are only known in the case of two of the species and are described below in connection with them. The genus is not a very extensive one, but is widely distributed. Most of the species at present known inhabit Southern and Central Europe to Central Asia, but a few are found in South Africa and South America. The genera *Anaitis* and *Chesias* are perhaps scarcely more than sections of the same genus.

farinata.

L. farinata Hufn. (= ? *illibata* Schiff. = *nivearia* Hbn.) (6 d). White, entirely without markings, the forewing with a very slight tinge of brownish or bluish grey. Forewing beneath with slightly stronger suffusion in basal part. Somewhat variable in the tone of colour, which may be somewhat more brownish, but none of the forms deserve naming. The early stages were first made known in 1906 by BUSSE, who bred it from the egg. Egg elongate oval, with small pitting; colour whitish yellow. Larva dull green with 3 fine brown dorsal lines and 2 strong, undulate lateral lines; anal flap brown. Pupa brown, dorsally deeply punctured, cremaster with 2 diverging points. The larva accepted *Sisymbrium officinale* in captivity, but BÜRGER has since found it in a state of nature on *Berteroa incana*, eating the flowers. It is full grown about the end of July. The moth appears in May and June and is very local in Central and Southern Europe, Tunis, Palestine, Asia Minor and Central Asia.

cynaria.

L. cynaria Guen. is unknown to me and is not quoted by STAUDINGER in his Catalogue; perhaps the type, which should be in the Paris Museum, is lost. GUENÉE's description runs: "It is very near *niveata* [*farinata*] of which it has the size and aspect. The wings are of the same white. The forewing has three lines formed of some blackish atoms: the first angled in the middle of the cell; the second somewhat arcuate, wavy or denticulate; the third straight, still more oblique, running from the apex to the inner angle. The hindwing is white, unspotted. The tibiae are as in *niveata*, but the femora are a little less thickened. I do not know the locality."

flavicornata.

L. flavicornata Zell. (6 e). Almost unicolorous yellow-grey above and beneath, the hindwing very slightly paler than the forewing, the forewing beneath as a rule slightly infuscated except towards the margins. Very similar to the least white examples of *farinata*, but with narrower wings, the forewing more pointed, its distal margin less curved, very strongly oblique. The antennal shaft is also yellow-grey, in the palest examples yellowish white. Occurs in Asia Minor, Ferghana and the Ili district and perhaps in Transcaspia. —

odessaria.

odessaria Bsd. is a darker variety or aberration from S. Russia (Odessa?) with all the wings ochreous grey. —

subfuscata.

subfuscata Stgr., from Armenia, is a smaller race, also darkened, the forewing being fuscous grey but the hindwing paler.

griseata.

L. griseata Schiff. (= ? *incanata* Hufn. nec L. = *asinata* F. = *infuscata* Ev. = *nivearia* Staint. nec Hbn.) (6 d). Variable in colour, usually pale grey, bearing (with rare exceptions) an oblique darker mark from the apex of the forewing, though this also varies much in distinctness in different individuals; occasionally it is continued nearly across the wing with moderate distinctness, but usually it becomes faint or altogether obsolete beyond the first radial. Under surface without the dark mark. — ab. **duplicaria** Hbn. has the forewing more strongly marked, the distal line being distinct right across the wing and forked at costa, while a second dark

duplicaria.

line is present in the middle of the wing. — ab. **abafii** Uhryk is a rare melanotic form, the forewing blackish

abafii.

with whitish central spot and whitish subterminal line. — ab. **obscurata** Stgr. (= *odessaria* H.-Sch., nec Bsd.)

obscurata.

is of a unicolorous dark grey, much darker than the type form. It is recorded from Southern Russia, Transcaucasia, etc. — Larva rather slender, flattened beneath, of uniform thickness throughout; head large and rounded, olive-green; ground-colour variable, olive-green, more yellowish green or greenish white, the spiracular region always pale (in the darker forms yellowish), marked with purplish dashes. Feeds on the seed-pods of *Sisymbrium sophia* and *Erysimum cheiranthoides* in July and August. Pupa sculptured and punctured, dull pale brown, wings dull green, distinctly veined, cremaster with two points. One winter, or sometimes two or even three are passed in this stage. The moth appears in June, frequenting cornfields or rough fields. Local in Central and Southern Europe and from Asia Minor to Ferghana.

fissurata.

L. fissurata Mab. (11 b) is of about the colour of *farinata*, dirty white to very pale yellowish grey, with the fringes and sometimes the hindwing purer white, but is very distinct in its much narrower wings, fine dark terminal line and dark, oblique, slightly curved line from the apex of the forewing about to the 2nd radial. Only known from Algeria and Tunis, first discovered at Gabes. Flies in March.

bifissana.

L. bifissana Rbl., recently described from the Jordan Valley, resembles *fissurata* but is darker ash-grey and has the oblique subapical streak *forked* on entering the cell. Foretibial claw short, but distinct. Wing-expanse about 29 mm.

L. coassata Hbn. (= *duplicata* Hbn. fig. 491 in err. = *coassaria* Bsd. = *stepparia* Bsd. = *multiplicata coassata* Stgr.) (6 e, as *duplicata*) is easily distinguished from all the preceding species of *Lithostege* by the larger amount of markings on the forewing above. In addition to a dark oblique line from the apex to the posterior margin, placed nearly as in *griseata*, two further lines are present, the first antemedian, bent in the cell, the second just beyond the middle, somewhat sinuous; a lunulate-dentate white subterminal line and a straighter, less distinct white proximal line accompany the outer oblique line. — ab. **asinata** Frr. is a more weakly marked form, usually of smaller size. The dark lines are more or less obsolescent, but the white subterminal remains distinct. — **ochraceata** Stgr., from Amurland, is smaller than the type and strongly shaded with pale ochreous. The type form ranges from S. Russia to the Ili district, but is local. Of its early stages we have no information.

L. pallescens Stgr. is unknown to me. It is said to be nearest *duplicata ochraceata*, like that narrow-winged, but rather smaller, much lighter, dirty white with the costal margin and the veins slightly darkened. Forewing with only an extremely weak, narrow, dull brownish submarginal band from the apex, weakest in its posterior half. Hindwing unmarked. Under surface clearer white, the band wanting. Taken on sandy ground, Tumartin-Gol, Uliassutai district.

L. castiliaria Stgr. (= *duroata* Th.-Mieg) (6 e). Quite distinct from all the other species. Forewing brown with a curved pale yellowish submarginal band. Hindwing whitish grey. Under surface much paler, quite weakly marked. Only known from Castile.

L. witzenmanni Stndf. (12 a). Forewing whitish, shaded with brown, especially in the distal area; a small but distinct black discal dot and numerous dark transverse lines; proximally to the discal dot these run very obliquely from both margins and are very acutely angled in the cell; distally to the dot a group of 3 contiguous grey lines and then a group of 3 brown ones run nearly parallel with the distal margin; a white subterminal line, not crenulate, interrupted anteriorly by an oblique dark line from apex; a further dark line exactly parallel with the distal margin and a fine dark terminal are separated by a second (narrow) white line; fringe white or whitish, with a fine dark intersecting line and some dark marks at tips. Hindwing dirty brownish white, browner in distal part, with very faint indications of darker lines. Forewing beneath somewhat infuscated, the markings in part showing through from above. Described from some ♂♂ from Mardin, Mesopotamia. The only specimen before me, a ♀ from Urumiah, N. W. Persia, is rather larger and whiter, possibly representing a local race.

L. bosporaria H.-Sch. (12 a) is only known to me from the figure, which, however, is according to STANDFUSS very correct. It differs from *witzenmanni* in having the brown markings developed into definite bands; a basal patch and first band acutely angled in the cell; middle band parallel with distal margin, but sending out a branch proximad at costal margin, thus irregularly Y-shaped; third and fourth bands parallel with distal margin, the fourth close to it, not quite reaching the apex (which remains white), crenulate on its proximal edge. Hindwing pale brownish grey with two white bands, the distal one narrower than the median. A rather small (circ. 28 mm) species, somewhat recalling the South African *Conchylia*, the ground-colour of the forewing being snow-white. HERRICH-SCHÄFFER gave the locality as "the neighbourhood of Constantinople", but GUENÉE received it from "South Russia" and according to STAUDINGER it only occurs in Russian Transcaucasia.

L. usgentaria Chr. (11 b) has never been described, but is founded on a recognizable figure in ROMANOFF'S "Mémoires". The type form, from Transcaspia, measures about 28 mm. Wings rather narrow; forewing very pale grey, proximally with a more brownish tone, distally more bluish; an oblique, slightly curved brown line runs from the posterior margin near the base about as far as to the middle of the cell; a narrow brown band parallel to and rather near the distal margin, edged with white proximally; a whitish subterminal line. Hindwing whitish brown-grey, with one or two whiter lines or bands. The only specimen before me is rather larger and more strongly marked than CHRISTOPH'S figure, a distinct, though minute black discal dot is present on each wing and the inner line of forewing is acutely angled in the cell and continued (though exceedingly fine) to the costal margin, much as in *witzenmanni*. — **ignorata** Stgr. is nearly twice as large as the type, much darker, the forewing more distinctly and darkly marked, the hindwing fuscous grey. Ferghana.

L. amoenata Chr. (12 a). 35 mm. Forewing bluish white-grey with two bands composed of several parallel black lines with the interspaces partly brown, partly white; the proximal band, commencing with 3 dark dots on the costa, is subobsolete in its anterior part, but reappears after an acute angle in the cell and is thence distinct to the posterior margin; distal band subsinuate, composed of 4 lines, about parallel with the termen; discal dot small but distinct; subterminal line thick, anteriorly irregularly dentate, but for the most part of its

course without teeth. Hindwing grey, somewhat darker distally, with two white bands beyond the middle. Forewing beneath mixed smoke-grey and light brown in the disc, costal margin speckled with white, the white line in the distal band and the white subterminal line distinct. CHRISTOPH found *amoenata* flying towards the end of April on the grassy slopes of the Kopet Dag, near Askhabad. When disturbed, they flew about 8—10 paces and again dropped in the grass.

excelsata. **L. excelsata** Ersch. (8 a). A variable little species, structurally distinct in having the 3rd radial and 1st median of the hindwing stalked — in the ♀, where the 2nd median runs into the distal margin, even very long-stalked; in the ♂, too, the costal vein does not anastomose with the cell. Ground-colour lighter or darker brown-grey or whitish, the forewing crossed by numerous darker lines, which may be either strongly or weakly expressed; the most prominent are a pair near the base, acutely angled behind the subcostal vein, a pair antemedian, bent in the middle though much less acutely, and a series of 4 postmedian, approximately parallel with the distal margin, but sinuous; beyond these latter a thicker, more ill-defined dark shade. Hindwing paler in proximal half, a discal dot indicated. Under surface almost unmarked. Transcaspia.

staudingeri. **L. staudingeri** Ersch. (6 e) is distinguishable at a glance by its olivaceous tone and by the comparatively regular markings, which recall an *Anaitis* rather than a *Lithostege*. The ground-colour, as shown on the hindwing and on the underside, is whitish, but on the forewing above this is mostly obscured by light olive-brown shading, only narrow areas on each side of the first dark band and distally to the second band remaining whitish; the bands themselves darker olive-brown, the first slightly curved, the second slightly bent near the costa; distal marginal area generally almost as dark as the two bands. Neuration as in *excelsata*. Zerafshan, Southern Ferghana and the Ili district, flying in April and May.

senata. **L. senata** Chr. (= *lenata* Chr.) (12 a) is related to the preceding species, but is much smaller. Ground-colour whitish, forewing at base light yellowish-brown, succeeded by a rather darker, curved band which is white-edged proximally; a median band, with slightly curved proximal edge and bluntly angled (between the 3rd radial and 1st median) distal edge, is somewhat darkened in its proximal part and more strongly in its distal; discal dot very weak; distal area (after a white interspace) light brown, containing a white subterminal line nearly parallel with the distal margin (in *staudingeri* this is wanting). Hindwing whitish, somewhat darkened on the veins and at the distal margin. Askhabad in June.

mesoleucata. **L. mesoleucata** Püng. Forewing rather broad, with the apex rounded, light wood-brown; near the base, from $\frac{1}{5}$ costal margin, a sinuate line, white-bordered distally; a second blackish, weakly curved line shortly before the middle, a third, somewhat dentate, from $\frac{3}{4}$ costal margin; median area almost pure white, separated from the latter of these lines by a blackish band; light subterminal line merely indicated, not dentate; distal margin with dull black-grey dashes; fringe grey-white, indistinctly chequered. Hindwing grey, the distal half with darkened bands, fringe unmarked. Underside white-grey, both wings with a darker band (on the hindwing narrower and sharper) beyond the middle, forewing further distally with a brown costal spot. Outer claw of foretibia almost as strongly developed as inner. Ili district.

distinctata. **L. distinctata** Chr. (12 a). Wing-form of *staudingeri*, to which CHRISTOPH considers it related, though it is smaller, without greenish tinge and differently marked. Forewing whitish irrorated with fuscous; a small reddish-grey basal area, bounded by a vertical, slightly indented black line; a not very broad red brown median band, bounded proximally by a not much dentated black line and distally by a thrice weakly dentate one and containing a further dark line parallel with the latter; on either side of this band is a narrow white edging; distally the wing is again darkened and contains a distinct, dentate white subterminal line, arising from an elongate white subapical spot. Hindwing yellow-grey proximally; a curved blackish median line or narrow band, not sharply defined proximally; distal area whitish grey, becoming more yellow-grey towards the margin and on the veins. Under surface whitish grey with dentate blackish postmedian line; fringes white, dark chequered. Askhabad in May. From the description and figure, *distinctata* would seem to me to be nearest *senata*, but differently coloured, much more sharply marked, with less curved proximal markings.

luminosata. **L. luminosata** Chr. is described as of the shape of *flavicornata*; wing-expanse about 27—28 mm. Forewing pale brownish ochreous, the transverse markings darker reddish-brown but not very distinct, only well expressed on the veins and at the margins; subbasal line very weak, slightly curved; antemedian rather strongly sinuous, traces of two or three small spots between this and the subbasal; postmedian with some slight indentations; distally two very feebly indicated lines which meet near the posterior margin. Hindwing yellowish

grey, unmarked. Underside paler, the costa of the forewing somewhat darkened and with the anterior part of the postmedian line showing through. Transcaspia, Zerafshan and Buchara. The original specimen was caught on 28 April.

L. notata B.-Haas. Forewing ash-grey, sprinkled with black, and irregularly shaded with yellowish, *notata*. especially in the middle; a white subcostal streak, usually widening into a white spot before the apex; a small, pointed white spot distally to the discocellulars; subterminal line white, straight, not reaching either margin, the veins anteriorly to this line sometimes dotted with black; some specimens also show faint traces of a black, distally yellowish-shaded postmedian stripe; marginal line blackish, interrupted with whitish; fringe whitish, divided by a grey line. Hindwing greyish with faint lighter submarginal line. Forewing beneath grey-white, darker towards the base, a postmedian line indicated at the costa; hindwing more snow-white, markingless. Expanse about 26—31 mm. Tunis: Gafsa, Dehibat, Fom-Tatahouine; Algeria: South of Biskra.

L. marmorata B.-Haas. A very small, very distinct species, unknown to me in nature. Forewing *marmorata*. white, with very faint tinge of yellowish; median area enclosed by very sharp, irregularly curved brown-black lines; a brown costal spot near the apex, reaching about to the 1st radial; the wing is also sprinkled with scattered brown scales, which become more numerous in the distal area and form (judging by the figure) some ill-defined blotches distally to the postmedian line in the posterior half of the wing; fringe irregularly chequered with brown. Hindwing concolorous with forewing, with a diffuse blackish cell-mark; marginal line distinct, brown, widened into a spot at the anal angle. Under surface more uniformly dark-dusted, the markings of the upperside weakly reproduced. Gafsa, Tunis.

L. (?) chaoticaria Alph. I do not know this species, described by ALPHERAKY as an *Anisopteryx*, but *chaoticaria*. suspect it may belong here. The description compares it with *Phthorarcha primigena*. Aspect similar to that species, colour the same, antennal ciliation much shorter. Size smaller (about 30 mm), wings broader, less elongate, all the markings wanting except the oblique apical mark of the forewing, which is even larger and more sharply defined than in *primigena*. Discovered by GRUM-GRSHIMAILO 10 April 1890 in the Nan-Chan Mountains.

19. Genus: **Anaitis** Dup.

Characters of *Lithostege*, but the forefemur not thickened, foretibia less extremely short, not forming a broadened horny plate at end, the outer claw obsolete, the inner less long and strong than in *Lithostege*. The face is on the whole more oblique, with a cone of projecting scales, the palpus rather stronger, but these latter distinctions are not constant.

Anaitis has been divided into two sections, or even two genera (*Anaitis* and *Docirava*) according to the structure of the costal vein in the ♂ hindwing; in the first it anastomoses with the subcostal (as in all the ♀♀), while in the latter it is merely connected near the end of the cell, as in *Schistostege*. Of the species which I have examined, only *plagiata*, *praeformata*, *postochrea* and possibly *simpliciata* would belong to the former, *lythoxylata*, *mundulata*, *columbata*, *boisduvaliata*, *obsitaria*, *opificata*, *pudicata*, *affinis*, *aequilineata* and *fulgurata* to the latter, but *simpliciata* is intermediate, the anastomosis being short and restricted to the distal part of the cell, and even in *postochrea* it is less pronounced than in *plagiata* and *praeformata*; hence I have preferred not to use it as even sectional, but to preserve STAUDINGER's sequence of species.

The larvae, so far as known, are of moderate proportions or rather slender, nearly cylindrical, with distinct lateral ridge and transverse skin-folds. They feed chiefly on species of *Hypericum*. The pupae are slender, with long tongue- and leg-case (projecting free and reaching nearly to the anal end) and are enclosed in slight, transparent cocoons. The moths are often double-brooded. They are in general larger and more brightly coloured than those of the preceding genus.

Anaitis is distributed throughout the greater part of the Palearctic Region and North India.

A. lythoxylata Hbn. (8a). Easily distinguished by its bright reddish ochreous colour. The markings *lythoxylata*. consist of fine darker transverse lines, the subbasal and a pair of antemedian curved, three postmedian (the central of them sometimes obsolescent) crenulate, and two fine, somewhat irregular subterminal arising from an oblique dark apical shade. Hindwing only with an indistinct, curved postmedian line. Both wings usually with an obscure cell-mark. Local in the French Alps, Italy, Valais, Transsylvania and Bosnia and in Northern Asia Minor and Transcaucasia. A mountain species, occurring at altitudes of 1400—1800 m in late August and September. The foretibial claw is slender and was overlooked by LEDERER.

- mundata*. **A. mundata** Stgr. (= *mundulata* ♀ *Guen.*, nec ♂) differs from the following species in its larger size (26—30 mm) sharply pointed (subfalcate) apex, its peculiar reddish-grey tone, strongly shot with rose-colour on the hindwing and costa and apex of forewing beneath, and in its quite distinctive markings, the two transverse lines being sharp and yellow. Occurs in Syria; STAUDINGER obtained it in numbers from Beirut.
- erubescens*. — **A. erubescens** Stgr. is a local form from Amasia, of still somewhat larger size and much redder colour on the upperside (violet-reddish); beneath, on the other hand, the rosy tone is on an average less bright.
- mundulata*. **A. mundulata** *Guen.* Pale brown, forewing with fine darker red-brown, slightly sinuous antemedian and postmedian lines, the former narrowly preceded and the latter narrowly followed by pale yellowish; cell-spot sharply expressed; subterminal line and a darker shade accompanying it proximally both very weak.
- submundulata*. Hindwing with a single pale, strongly curved line beyond the middle. Syria and Mesopotamia. — **A. submundulata** Stgr. (8 a) is an ash-grey form with a tinge of violet, the markings on the whole somewhat more sharply expressed. It was first collected in the Southern Taurus at the end of April and beginning of May and was treated as probably a separate species; but it has since been ascertained that it occurs also as an aberration among typical *mundulata*.
- musculata*. **A. musculata** Stgr. Size, shape and general coloration of *mundulata submundulata*. Forewing ashgrey, without a tinge of violet, finely dark-dusted; discal spot crescentic, sharply black; 3 light (dull yellowish) lines, mostly somewhat dentate, dark edged, the first very indistinct, the third the most distinct and broadest, much nearer to the distal margin than in *submundulata*; an oblique dark mark from the apex; fringe almost white, distinctly dark-chequered in the distal half. Asia Minor and N. W. Kurdistan.
- columbata*. **A. columbata** Metzner (= *nomadaria* *H.-Sch.*) (11 a). Much larger than the two preceding species, size and shape nearly as in the well-known *plagiata*, the apex of the forewing slightly more acutely produced. Fawn-colour, the forewing a little more inclining to reddish, the hindwing to yellowish. Forewing with the lines yellowish, very slightly sinuous; subbasal nearly obsolete; antemedian narrowly dark-edged distally, at times with a characteristic dark cloud accompanying it in the cell; postmedian narrowly dark-shaded proximally; distal area with 2 or 3 very faintly indicated pale lines, the true subterminal the least indistinct; a faint dark oblique subapical shade. Hindwing almost unicolorous. Under surface rather more ochreous in tone, the forewing with two pale lines, the hindwing with a very weak postmedian. Parts of Asia Minor, Transcaucasia and the Northern Caucasus; STAUDINGER adds N. Persia with a query; DRENOWSKY has recently recorded it from Bulgaria.
- annexata*. **A. annexata** Frr. (= *boisduvaliata* *Dup.*) (6 k as *boisduvaliata*). Light ash-grey, with some fine brow dusting, which becomes strong in places, to form the transverse markings of the forewing; basal area very weakly marked, sometimes a moderately distinct double line discernible near the antemedian band; antemedian double, usually also filled in with brown, especially at the veins, oblique from $\frac{1}{3}$ of hindmargin to cell, then bent so as to run perpendicularly to costa; postmedian consisting of 3 lines similarly filled-in, the outermost angled on the 1st radial and curved posteriorly, followed distally by a broad white line; a strong oblique line from apex and a double brown line before the pale subterminal, which is not dentate. Hindwing almost unicolorous. Under surface rather more brownish, very weakly marked. — ab. **infuscata** *ab. nov.* is strongly suffused with brown throughout, the bands darker brown, pale-edged. The type is in the British Museum, unfortunately without exact locality. Distributed in Asia Minor; also Malatia and Armenia. FREYER's name was published in Dec. 1830, DUPONCHEL's in Nov. 1831.
- praeformata*. **A. praeformata** Hbn. (= *cassata* *Tr.*) (8 d). This handsome species is easily distinguished from *plagiata* (which it nearly resembles in colour) by the strong darkening of the lines or bands in the costal part of the forewing, the deep curve of the antemedian in the cell, accompanied proximally by a strong rufous patch, and by the more sharply dentate postmedian. — ab. **rosacea** Kieffer (= aphrodyte *Schawerda*) has a more intensive and extended red suffusion, nearly covering the forewing. — ab. **conflua** *F. Hoffmann* is a form in which the antemedian and postmedian bands (groups of lines) meet at the median vein, posterior to which the central area becomes clouded with brown like the postmedian band itself and with the veins dark-marked. — Larva similar to that of *plagiata*, somewhat thicker, yellowish grey with dark dorsal line and white lateral ridge; on *Hypericum perforatum*, hiding among the seed capsules in the autumn, hibernating and reaching maturity in May. Pupa brown. Imago in June and July in mountainous districts nearly throughout Central and parts of Southern Europe, also in Transcaucasia. STAUDINGER and REBEL except Western Europe, but I have since recorded it from Spain (*Ent. Rec.* vol. 19, p. 162).
- poneformata*. **A. poneformata** Stgr. is similar to *praeformata* but much smaller, with snow-white hindwing and dark grey underside, whereas that of *praeformata* is strongly shaded in parts with reddish brown. Koko-Nor.

A. plagiata L. (= duplicata F. = triplicata Geoff.) (6 k) is the type of the genus and at the same time *plagiata*. the commonest and most widely distributed species. In the typical form the two narrow bands or bars (each composed of 3 approximated lines) remain separate throughout their course, enclosing a pale central band. — In ab. **tangens** W. Fritsch the two bands meet about the median veins, dividing the pale centre into a larger *tangens*. anterior and smaller posterior patch. — In ab. **fasciata** Garbsk. (= cotangens W. Fritsch = conflua F. Hoffmann) *fasciata*. they meet similarly in the middle of the wing and do not again separate, but form a broad posterior median band. — More remarkable and more worthy of a separate name is ab. **ruberata** Rbl., a rare form in which the *ruberata*. bars remain separate but the entire space between them is darkened (red-brown or brown-grey) forming a real fascia, whereas — as FRITSCH has already remarked — GARBOWSKI'S name of *fasciata* was not so fortunately applied to the preceding form as HOFFMANN'S of *confluens*. — Ab. **suffusa** ab. nov. is a still more extreme *suffusa*. development, of which I have seen a few English examples (cf. BARRETT, Lep. Brit. Isl. vol. 8, p. 421). Ground-colour shaded with brown, the bands confluent into a single blackish band. It gives quite the impression of a different species. — **efformata** Guen. (= pallidata Stgr.), is, I believe, rather an aberration than a local race, *efformata*. in any case certainly not a species as GUENÉE (judging from a single Syrian example) supposed. There is no doubt, however, that the small, weakly marked forms which have been described under these names are more frequent in southern and eastern localities than in western Europe, though they do occur in the latter (perhaps chiefly in the second brood). In Malta, Greece, Asia Minor and Syria they seem to be of very general occurrence. — Almost everywhere there is much variation in size and this is not entirely sexual nor seasonal. The ground-colour also varies; thus Scotch specimens are more bluish grey (less violet), more approaching the tone of *simpliciata* Tr.; those from chalky soils (also, according to BARRETT, Irish examples) more white, both above and beneath. Typically, the underside is much flushed with reddish. — Egg whitish, without gloss, micropylar rosette 11- to 12-leaved, sides with regular polygonal reticulation, each cell again more irregularly subdivided. Larva somewhat elongate, tapering a little anteriorly; brown or slate-colour with a paler, more yellowish lateral stripe, dorsal area somewhat darkened, with a still darker mediodorsal line. Feeds on the leaves and flowers of Hypericum, especially H. perforatum. Pupa slender, wing- and antenna-cases elongate, dorsum and abdomen pitted, cremaster short, ending in blunt forked protuberance; brown with black spiracles. The moth is double-brooded, except in its northernmost localities, appearing in May, June and August—September, the larvae of the first brood hibernating. It rests by day on bushes, rocks or fences, often head downwards, and makes no attempt at concealment; but it is generally very shy, dashing off wildly when approached. It is found throughout Europe, excepting the Arctic Region, in N. Africa, Western and Central Asia Minor and Syria and again in the Mountains of Afghanistan and Kashmir. — **perelegans** Warr., which *perelegans*. represents *plagiata* in Japan, is probably a distinct species, although STAUDINGER has not even recognized it as a variety (!). The foretibial claw appears rather slighter, but otherwise the structure agrees. Extremely similar in size, shape and markings, lines of forewing not marked with black on the veins, postmedian lines straighter, not curving outwards at hindmargin, distal area with better defined ferruginous blotch at end of apical streak, two well-developed transverse dark lines, the pale subterminal obsolete; under surface not flushed with reddish, forewing with no dark costal mark at origin of postmedian line (generally distinct in *plagiata*).

A. fraudulentata H.-Sch. (= brussearia Mann, M. S.), (12 a) from the neighbourhood of Brusa, is said to be *fraudentata*. broader-winged than *plagiata*, more bluish grey, not violet, apical streak fine, black, not overlaid with rust-colour, the three black spots on the costal margin and the dash on the median vein thicker. BOHATSCH (Wien. ent. Zeit. vol. 5, p. 200) evidently misidentified the species; STAUDINGER treats it as a Darwinian representative of *plagiata*.

A. simpliciata Tr. (= pierretaria Guill. = magdalenaria Bell.) (18 c). More blue-grey than *plagiata*, *simpliciata*. the colouring more uniform, the lines and bars somewhat similarly placed, generally not very strong, the subbasal much less angulated near the costa, one or two intermediate lines before the antemedian rather well expressed, postmedian less angulated on the 1st radial, distal area traversed by two fine lines, but with the pale subterminal and the apical streak almost or entirely obsolete; veins marked with dark dots on the lines. Forewing beneath dark grey, hindwing whitish. — ab. **obscurata** ab. nov. (Mill. Icon. Chen. pl. 145, f. 3) is a *obscurata*. curious suffused form in which the ordinary markings have disappeared, giving place to an obscure median band. — **graeciata** Stgr., from Greece, differs in having the ground-colour of the forewing luteous grey. — *graeciata*. Larva shorter than that of *plagiata*, head small, somewhat retracted; vinous red, with lateral ridge and venter yellowish white; dorsal line fine, brown, interrupted, on the posterior segments broad and continuous; 3 fine, interrupted dark subdorsal lines; spiracles small, black. On Hypericum alpinum, hibernating. Pupa brown. The moth is according to MILLIÈRE double-brooded, but the principal emergence is in July-August; it occurs at altitudes of 1700—1800 m., settling on whitish rocks on the surface of the ground. It is very local and almost confined to Southern Central Europe: S. France, S. E. Hungary and the Balkan range, also as an aberration in Greece.

- fraternata*. **A. fraternata** H.-Sch. (12 a) "Smaller than *fraudulentata*, much lighter grey, the dark bands not so sharp, but broader, especially towards the costal margin; the light parts of the costal margin whiter, the fringes with sharp dark dividing-line and intersected with pure white, the space between the subterminal and the termen darker." Local in Asia Minor.
- obsitaria*. **A. obsitaria** Led. (11 b). Quite different in colour from the preceding group, though with similar pattern. Ground-colour very light brownish grey, the lines more brownish, sometimes inclining to sand-colour, varying much in intensity, usually strongest at the costal margin, all more or less dentate, the antemedian rather strongly bent outwards in the cell; apical streak usually weak; underside very indistinctly marked. Local in Kurdistan and Mesopotamia.
- opificata*. **A. opificata** Led. (— *kawrigini* Chr.) (11 b) is similar to the preceding species but of a more reddish tone, with the two bars which form the median band of the forewing dark grey, not brown, the discal marks better developed, the veins strongly dark-dotted on the reddish areas which precede and follow the median band. Hindwing above darker than in *obsitaria*. Transcaucasia to N. Syria.
- numidaria*. **A. numidaria** H.-Sch. (6 g) is a handsome species, more varied and sharply marked than most of its congeners. The antemedian and postmedian groups of lines are strongly filled-in with brown so as to form definite bands, the former is accompanied proximally and the latter distally by sharp white edging; they form sharper angles. The pale subterminal line is also distinct and is accompanied proximally by a strong brown shade. Northern Asia Minor to Persia.
- pudicata*. **A. pudicata** Guen. (= *uvaria* Walk. = *vastata* Walk.) (12 b) differs from all the preceding in the beautiful rose-colour which suffuses the costal area of the forewing, the distal margin (or at least the fringe) and the hindwing, the latter being entirely rose pink beneath except for narrow margins. The only distinct markings are: on the forewing above a pure white discal dot and two pale yellowish lines; on the hindwing above a single grey line across the middle. From the species (or forms) which follow, it only differs in having the postmedian line strongly bent outwards at the 1st radial. It inhabits N. India and Afghanistan.
- affinis*. **A. affinis** Warr. (6 k) is possibly only a form of the preceding, as the two seem to occur together in Sikkim; from West and Central China, however, I have seen only *affinis*. The postmedian line is straight, but I can find no other constant difference. WARREN records also two from Japan; perhaps wrongly labelled? —
- brunnearia*. **brunnearia** Leech (11 c) founded on a single example from Pu-tsu-fong, is almost certainly nothing more than an aberration of *affinis*. The duller colour is chiefly due to its being in inferior condition, but the lines are rather thick, rather near together and the postmedian more oblique and a little curved in its anterior part.
- aequilineata*. **A. aequilineata** Walk. (8 c) entirely lacks the rosy colouring. The forewing above is brownish grey, the yellowish lines broad, ferruginous-edged, the postmedian running into the apex. On the underside the hindwing (especially in its distal half) and the apical part of the forewing are strongly shaded with reddish-orange; the lines of the forewing show through. N. W. India.
- fulgurata*. **A. fulgurata** Guen. (= *macrocalata* Walk. = *medmaria* Walk. = *reciprocata* Walk.) (8 c). Coloration of underside somewhat as in the preceding species, but with the hindwing more uniformly orange-ochreous. Upper surface remarkable for the extremely irregular course of the lines, all of which are very finely white-edged; subbasal line very strongly outcurved in cell, interrupted on median vein by a long grey streak which runs from base into the angle of the antemedian; antemedian acutely angled outwards on median vein and right-angled on fold; median area deep velvety brown with a narrow, straight whitish band in its centre; postmedian line strongly bent outwards in middle. N. W. Himalayas; also in Sikkim.
- postochrea*. **A. postochrea** Hmps. (11 c) forms in some respects a transition towards the following genus, the foretibial claw being small and slender. The markings of the forewing also show some resemblance to those of *C. paludata*, but really cannot be confused with those of any known species. A reddish ochreous tone which suffuses the forewing above becomes more pronounced on the hindwing and the entire undersurface, which are bright ochreous throughout. Beneath the ochreous becomes more reddish on the hindwing and at the costal margin of the forewing, and in these places a dark postmedian line is present. Kulu and Koksar in the N. W. Himalayas.

20. Genus: **Carsia** Hbn.

Only differs essentially from the typical form of *Anaitis* (costal vein of hindwing anastomosing in both sexes) in having the foretibia unarmed. In addition, the 2nd median vein of the hindwing is more oblique and consequently runs into the hindmargin nearer to the hinder angle. I only know one of the species but both further agree in their small size and in their scheme of markings.

Confined to the Palearctic and Nearctic Regions, only two species known.

C. perpetuata Led. Near *paludata*, agreeing in shape. Greyish-white. Forewing with antemedian band effaced in its anterior half, postmedian effaced in its posterior part, their colour yellowish-brown; discal dot very feeble; distal area washed with wood-brown; an oblique dark shade from apex; median vein, first subcostal and the three radials marked with blackish longitudinal lines; fringe pale, dark-chequered. Hindwing much more weakly marked. Forewing beneath grey-brown as far as the postmedian line, thence showing traces of the upperside markings. Hindwing beneath rather darker and better marked than above. Transcaucasia. *perpetuata.*

C. paludata is widely distributed in high latitudes and is common to both hemispheres. It is divisible into three principal races. — **paludata** Thnb. (= *sororiata* Hbn. = *pruinaria* Ev.) (6g) is of a rather uniform grey or bluish-grey colour, the lines of the forewing usually not, or scarcely, accompanied by dark bands in the central area, the fine white line which follows the postmedian seldom sharply expressed, often almost obsolete, except anteriorly; reddish shading entirely wanting or confined to the region of the oblique apical streak. Under surface dark reddish grey. Inhabits Scandinavia, Arctic Russia and N. Siberia; also, according to STAUDINGER, the Kentei Mountains. — ab. **obscurata** Schöyen is much darker than the type-form, with the reddish shade altogether obsolete; according to the figure, the dark bands are, however, better developed than in typical *paludata*. Described, as a possible local race, from Sydvaranger. — **labradoriensis** Sommer (= ? *boreata* Pack.) is also poorly marked, but is narrower-winged, more brownish grey or tinged with reddish. Only known from Labrador, but I have seen a similarly coloured example from E. Siberia and I suspect that *boreata* Pack. (an older name), from Mount Washington (New Hampshire) is nearly or quite the same form. — **imbutata** Hbn. (= *sororiata* Tr. nec Hbn.) (6g) is much more variegated. Ground-colour more whitish, with subbasal line and two bands in the median area distinct, brown, distal area from about the 5th subcostal to the 1st median more or less strongly suffused with red-brown. Under surface lighter and more strongly reddish. Extremely local in N. Germany, the Alps, Scotland, N. England and N. and Central Russia. — The egg is at first whitish yellow, becoming deeper yellow; micropylar rosette 8-leaved; sides with irregular reticulation, in places undeveloped. The winter is passed in this condition. The larva is rather stout, of uniform thickness, dorsal surface rather deep brownish-red, with very fine blackish-red dorsal and subdorsal lines; a broad bright yellow lateral stripe containing at the folds between the middle segments some beautiful red spots; venter pale greenish yellow with paler, dark-edged central line. Feeds on *Vaccinium* in spring and early summer, showing a preference for the flowers. Pupa slender, antenna-cases ending in a small bifid projection; yellow-brown, abdomen more reddish. The moth frequents bogs and moors and flies at dusk but in hot weather is restless by day. It is on the wing in July and August. *paludata.* *obscurata.* *labradoriensis.* *imbutata.*

21. Genus: **Chesias** Tr.

Closely akin to *Lithostege*, perhaps scarcely separable on a strictly scientifically grounded system. Some of the few distinctions given by LEDERER are untenable and the chief difference lies in the more strongly glossy wings, rounded apices and in the exceptional resting-posture, the wings being more closely rolled up than in most Geometrids. The foretibia is perhaps less extremely thickened than in most *Lithostege*, but intergrades occur in that genus; the inner claw is strongly developed, but the outer is slight and I can find no process in the middle. The tongue, antenna and legs are less elongate than in *Anaitis*. The costal vein of the hindwing anastomoses with the cell in both sexes.

The larvae of the two best-known species feed on broom and are moderately elongate, smooth, pretty uniformly cylindrical. The pupae are very distinct from those of *Anaitis* in the much shorter leg-cases, which only project slightly, scarcely reaching as far as the end of the 5th abdominal segment, and are remarkable for the presence of large circular, or somewhat oval dorsal depressions, one on each segment from the 1st to the 8th abdominal. Unfortunately I cannot compare *Lithostege* pupa. The duration of the pupal stage is irregular, especially in *rufata*, and both the best-known species have also a peculiar habit on emergence, often remaining for many hours before the expansion of the wings takes place. The same has been observed in *Lithostege griseata*, which has even delayed as long as 36 hours before expanding.

Only 3 species are known, all inhabiting the western Palearctic Region. The generic name *Eucestia* Hbn., employed by MEYRICK, is a synonym, but "*Eucestia*" *neddaria* Swinh., described from Africa, does not belong to this genus.

legatella.

C. legatella Schiff. (= *gelatella* F. nec L. = *spartiata* Herbst = *soubryana* Vill.) (6 b) is usually easy to distinguish by the whitish streak which runs from the apex of the forewing, broadens and then runs parallel with the costa as far as the discocellulars, and usually continues as a narrow, often somewhat interrupted line nearly to the base. A dark median band is discernible, but is of very peculiar construction, being broken into 3 oblong, somewhat pale-edged sections, the longest (about 7—8 mm) being placed between the costal margin and the pale streak, the second (commonly enclosing a short white streak) in the middle of the wing and the third (variable in size and shape) running obliquely from the hindmargin nearly to the fold. The pale subterminal line is rather straight, only very faintly crenulate, and is often followed by a second close to the margin. Hindwing and under surface unmarked. In the typical form the ♂ and sometimes the ♀ has the forewing predominantly rather dark reddish brown, the ♀ commonly rather paler and greyer. — In the form *capriata* Prout, from the island of Capri and probably as an occasional aberration elsewhere, the ground-colour is very much paler, the subcostal streak almost entirely obsolete, the somewhat greyer median band less interrupted but extremely ill-defined. — Larva usually dark green with darker, paler-edged dorsal line, broad whitish or yellowish subdorsal, conspicuous white lateral stripe and 3 white lines ventrally; spiracles red, ringed with black. Adaptive to its environment, a yellow form being frequent on plants on which there is much bloom, while a much blackened form has been recorded from dry, stunted plants. April to June, on broom. Pupa red-brown, dorsally rather darker, wings tinged with green; buried deeply in the ground without a cocoon. The moth usually appears in the late autumn (October or November), but cases have been recorded in which emergence has been delayed until the spring. Normally the winter is passed in the egg stage. *spartiata* is not easily disturbed by day, but is found abundantly at night sitting among the bushes with the wings hanging down and in a position which gives it a wonderful resemblance to the seed-pods which have opened to discharge the seed. Widely distributed in Central Europe, Britain, etc.; apparently more local in South-western Europe and absent from the South-east.

rufata.

occidentalis.

cinereata.

plumbeata.

linogrisearia.

C. rufata is on an average smaller than the preceding, but is very variable both in size and markings. The pale subcostal streak is wanting, though there is generally some slight pale yellowish clouding distally to the cell and this occasionally runs out streak-wise towards the apex. Subterminal line as in *legatella*; a pale basal patch is usually distinct, bounded by an angulated dark line; an indistinct, irregular antemedian line is present and a very characteristic, distinct broad sinuous postmedian, usually darkest in its anterior half; median space clearer, more violet-grey. The variation is chiefly geographical, a series from a single locality often appearing very uniform. — **C. rufata** F. (= *obliquaria* Schiff. = *bombycata* Hbn.) (6 b) is the prevailing form in Central Europe and reaches the Balkans and the extreme North-west of Asia Minor. The forewing is a good deal mixed with reddish, the blend of colours being often nearly as in *legatella*, though their distribution is different. — **C. occidentalis** Delahaye, said to be common to several departments in the West of France, is a small form, reddish grey, the antemedian and median lines obsolescent, the latter often quite wanting, the postmedian ferruginous, not black-marked, the pale subterminal distinct, shaded with blackish proximally and reddish distally. — **C. cinereata** Stgr., from Spain, is a pale cinereous form almost entirely without rufous admixture. — **C. plumbeata** Stgr., from N. Africa, is a similar but much darker form, the forewing being of a dark leaden-grey colour. — **C. linogrisearia** Const., of which unfortunately I cannot compare specimens, is said to be also of a pure ash-grey, but is very strongly marked, the subbasal line more dentate, the lines of the median area forming some superposed rings (i. e. the antemedian and postmedian meeting in places, more as in *legatella*). Only known from Corsica and treated by KOLLMORGEN as a distinct species. — Egg rather small, oval, slightly broadened and deepened at the micropylar end; the surface faintly pitted; colour delicate orange, approaching salmon-colour. Larva closely similar to that of *legatella*, the subdorsal line edged with darker green; spiracles black. Feeds on broom at night and is then rather conspicuous, as it has a habit of stretching itself out from the plant at full length; it may be found from July to September. Pupa similar to the preceding, passing the winter or sometimes two winters. The moth is very erratic in its time of emerging which — at least in some seasons and in some localities — may cover a period from May to September; I have found them chiefly in June. They may occasionally be disturbed by day, but are then much less restless than most Geometrids. They fly rather late in the evening and come freely to a strong light.

korbi.

C. korbi Bohatsch. Shape and structure quite as in *legatella*. Head, thorax and upperside of forewing flesh-colour without a trace markings; palpus somewhat darker. Abdomen, hindwing above and both wings beneath yellowish white. Larva green with yellowish lateral stripe. It was discovered by KORB in June 1901 at Takaltu above Kasikoporan (Russian Armenia) at an elevation of over 2000 m., feeding on *Cephalariae procera*. Pupa brown, larger, stouter and smoother than that of *spartiata* and without the indentations on the mid-dorsum, hence perhaps not a true *Chesias*. The moth emerged at the end of September.

22. Genus: **Episauris** Rbl.

Antenna in ♂ thickened and flattened. Palpus with 2nd joint elongate (especially in the ♀), rough-scaled, 3rd joint small. Hindtibia in ♂ with hair-pencil, in both sexes with terminal spurs only. Abdomen in ♂ greatly elongate. Forewing with areole double. Hindwing in ♂ narrow, the inner-marginal area developed into a folded lobe at the base, submedian veins wanting; in both sexes with the costal anastomosing with the cell to near its end, 2nd subcostal stalked with 1st radial, discocellulars biangulate, 2nd radial arising nearer to the 3rd than to the 1st.

This genus was erected by REBEL for a single species, but is perhaps scarcely necessary, as it only differs from *Acasis* in the slightly thicker antenna, longer ♂ abdomen and more constantly stalked 2nd subcostal of the hindwing (in *Acasis* this is usually separate, but occasionally short-stalked). The peculiar lobe or lappet at the base of the ♂ hindwing is distinctive of this group, which is widely distributed and has been erected by WARREN into a separate subfamily under the name of *Trichopteryginae*.

E. kiliani Rbl. (12a). Forewing greenish with the markings blackish-fuscous, very variable in expression. *kiliani*. In the general scheme it very closely resembles *Acasis viretata*, from which it is best distinguished by the structural characters given above; the discal spot is larger and the distal dark markings are more connected transversely (in *viretata* they are chiefly expressed as dots or dashes longitudinally on the veins). Hindwing somewhat more yellowish grey than in *viretata*, also with conspicuous discal spot; the ♂ appendage perhaps rather more strongly developed than in that species. Under surface in general rather more strongly marked than in *viretata*, hindwing usually with two curved lines in the distal half, the inner one rather less strongly curved than the corresponding single line of *viretata*. Canaries and Madeira, February to June.

23. Genus: **Acasis** Dup.

Palpus as in the preceding genus, only in *sertata* short. Antenna less thickened. Hindtibia with terminal spurs only, ♂ with hair-pencil. Abdomen not elongate. Neuration nearly as in *Episauris*, but with the 2nd subcostal of the hindwing in the ♂ generally arising just before the end of the cell, rarely so long-stalked as in that genus. Lobes on hindwing small.

Larva stout posteriorly, tapering anteriorly, head small, rounded, tubercles very small, spiracles very small, spiracular line wanting, anal extremity ending in 2 minute points. Pupa short and thick.

A small genus, consisting of a few Palearctic species and one North American. The type is the European *viretata* Hbn. STAUDINGER places it at the end of his *Lobophora*, but I have brought it forward on account of its close relationship to *Episauris*.

A. viretata Hbn. (= *trinotata* Don.) (6 g). Forewing green, in old specimens fading to a dirty yellow *viretata*. the markings black, varying in number and intensity; median band varying in breadth, sometimes almost solid, oftener dissolved more or less into lines. Hindwing pale grey, almost unmarked. Forewing beneath somewhat smoky, with faint traces of the median band; hindwing less smoky, a postmedian line somewhat more noticeable than above. Larva green, usually with a red dorsal line and commonly with a dorsal pattern of red blotches on the 1st to 6th abdominal segments, which, however, vary in shape and extent. It feeds on various berry-bearing plants, perhaps particularly holly, privet, buckthorn and ivy and is rather partial to the flowers and berries. It feeds in June and July and again in September and October. Pupa somewhat rough, the eyes, wing-veins, etc. well defined, cremaster with several fine curved bristles, the two central the largest; brownish, the wing-cases bright olive green. In a roundish cocoon on or just beneath the ground. The pupae from the second generation hibernate. The moth appears at the end of April or in May and a second brood in August and early September. It is widely distributed (but local and generally scarce) in Central Europe and Russia and occurs also in N. W. India, Formosa and according to STAUDINGER in Eastern Siberia and Japan. Indian examples (of which one is erroneously figured as *consobrinaria*, 6 g) are on an average rather small and dark.

A. appensata Ev. (6 g) is closely related to *viretata*, but the ground-colour of the forewing is light *appensata*. brownish grey, not green, the basal area is more darkened, the central band of more uniform breadth throughout and less black, etc. — **baikalensis** B.-Haas, from the Sajan district, is on an average smaller and more delicately built and of a pure black-grey colour without any admixture of brown. The larva is similar to that of the preceding species, green with red dorsal and subdorsal lines which are generally connected, at least on *baikalensis*

the middle segments, by other red markings. It feeds on *Actaea spicata* in July, at first in the unripe berries, later between loosely spun leaves. Pupa light brown, head and anal end somewhat darker. The moth emerges in April and May. In Europe it has a local distribution from Bavaria to the Ural and in Asia it extends across Siberia to the Ussuri.

muscigera. **A. muscigera** Butl. (= *olivaria* Leech) (12b). Of this species I have only seen two ♀♀ but on account of its long palpus, biangulate discocellulars, etc., I have no doubt it should be referred to this genus although its shape is more that of *Nothopteryx*. Yokohama.

sertata. **A. sertata** Hbn. (= *appendicularia* B.) (6 f) differs from the other species of *Acasis* in its much shorter palpus, which is formed about as in *Nothopteryx*. Wings dirty white (in freshly bred specimens greenish), marked with brown-grey. Hindwing very weakly marked above, beneath whiter, with distinct cell-spot followed in the middle of the wing by a strongly curved line. Variable in the strength of the markings which (as in *viretata*) appear blacker in worn specimens. The colouring in our figure has not come out satisfactorily. —

fumidata. **fumidata** Trti. & Verity is according to the description a heavily marked form with ground-colour smoky brown, not whitish. Terme di Valdieri, Maritime Alps. — Larva yellow-green with white subdorsal lines and blackish head, feeding on sycamore (at first on the buds) in early spring, full-fed in May. Pupa compact, brown, with 2 cremastral points. Imago in September–October, local in Southern Central Europe. The egg hibernates. Statements that the moth does so are not substantiated.

neurogrammata. **A. neurogrammata** Püng. I gather from the figure and description of this species that it is probably closely related to *polystictaria* Hmps. from Yatung, Tibet, possibly even a form of it, with the veins more strongly black-marked. If so, it is referable by the neuration to *Acasis* though the palpus is not much longer than in *sertata*. Expanse about 37 mm. Forewing ash-grey with a slight tinge of brown, the discal dot small and weak, close beyond it a curved dark line (excurved in anterior half, incurved in posterior) accompanied by brownish shading which fades out distally; the veins in the distal half of the wing and in part in the median area strigulated and dotted with black. Hindwing whitish grey, unmarked; the lobe as in *carpinata*. Forewing beneath brown-grey, both wings with fine discal dot, otherwise unmarked. Koko-Nor, 2 ♂♂.

bellaria. **A. bellaria** Leech (11a). Much smaller than *muscigera*, somewhat intermediate in shape between that species and *viretata*. Distinct from both in the restriction of the green colour, the distal area from the 3rd radial to the hindmargin, sometimes also the central area, being strongly suffused with whitish; in any case a white spot, as in *muscigera*, remains on the middle of the hindmargin. Further distinguished by having a distinct dark band midway between the subbasal and antemedian lines. Under surface pale, especially on the hindwing. Japan; Ussuri. I have only seen LEECH's types; in the ♂ the 2nd subcostal of the hindwing is separate, in the ♀ short-stalked.

24. Genus: **Oulobophora** Stgr.

Face somewhat prominent, tufted. Palpus quite moderate, rough-scaled. Antenna in both sexes simple. Hindtibia in ♂ with hairpencil, in both sexes with all spurs. Forewing with distal margin strongly bent or almost angled in the middle, anteriorly often slightly concave, posteriorly slightly concave and strongly oblique; areole double. Hindwing small, in the ♂ with the submedian veins and the 2nd median wanting, but with the basal lobe extremely ill-developed; in both sexes with the costal anastomosing with the cell; discocellulars biangulate.

Only two species are known, extending from the Balkan Peninsula to Syria.

internata. **O. internata** Püng. (= *macedonica* Stgr.) (8a) is distinguished by the more extreme shape of the forewing, the almost straight proximal edge of the median band, the greater breadth of the band itself, its brighter pinkish-brown colour and other characters. Only known from Asia Minor, Macedonia and Greece.

externata. **O. externata** H.-Sch. (6f). Usually darker than *internata*, but with the median band varying between reddish brown and blackish brown, its proximal edge incurved, its distal oblique at the costa, somewhat prominent in the whole exterior part, marked with strong blackish dashes on the veins; a rather conspicuous whitish blotch occupies the middle of the distal area. Turkey, Bulgaria, Greece, Asia Minor and Syria.

25. Genus: **Nothopteryx** *Prout*

Face smooth. Palpus generally rather short, in *sabinata*, *obscuraria* and *rivularia* long. Antenna in both sexes simple. Hindtibia with terminal spurs only. Thorax and abdomen not crested. Forewing with areole double. Hindwing: in ♂ with small but distinct lobe at base, costal separate (sometimes even widely separate) from subcostal, connected by a bar near the end of the cell, 2nd subcostal arising separate, or sometimes from the same point with 1st radial, submedians wanting, 2nd median short, running to inner margin; in ♀ with costal anastomosing, 2nd subcostal stalked, all veins present; in both sexes the discocellulars usually not biangulate, the 2nd radial arising from or from above the middle. According to MEYRICK the ♀ occasionally shows the characteristic costal and subcostal neuration of the ♂.

Larva moderately stout, smooth, tapering somewhat anteriorly and posteriorly, anal extremity with 2 small, horizontally directed points. On trees and shrubs. The winter is usually passed in the pupal stage.

Distributed in the Palearctic Region and Tibet, at least one species also in North America.

N. ustata *Chr.* (= *choasptis* *Ob.*) (6f) is distinguishable at once from all the other Palearctic species *ustata*. by the form of the postmedian line, which is sharply angulated at the hinder angle of the cell and then runs basewards for some distance along the median vein. The whitish groundcolour is sometimes more suffused with brownish than in the specimen figured, especially forming a subterminal blotch between the radials. Under surface somewhat more reddish, the markings of the forewing faintly showing through. ♂ antenna thicker than in *polycommata*, abdomen long, wing-lobes as in *carpinata*. Eastern Siberia and Japan. In Amurland CHRISTOPH took it in May on oak-trunks.

N. sabinata *Hbn-Gey.* (6f), easily recognizable from our figures, differs from most of the genus in its *sabinata*. long palpus. The darker brown ground-colour of both wings is also distinctive, only the narrow lines which bound the median area of the forewing remaining white. The ♂ is as a rule slightly darker and more violet-tinged than the ♀, which inclines more towards yellowish brown. The larva is short and stout, green with darker dorsal line and feeds in June on *Juniperus sabina*. The moth is very local, occurring in July in the Alps of Switzerland and Bavaria and Tyrol, perhaps also at Herculesbad; the only recorded locality outside Europe is the neighbourhood of Brusa.

N. obscuraria *Leech* (6g). Closely related to *sabinata*, shape and ground-colour the same but the markings of the forewing very much weaker, the median band only very finely and inconspicuously pale- (not white-) edged. The antemedian line (scarcely traceable in weakly marked specimens) is quite differently formed, projecting in two very strong V-marks, in the cell and on the fold; postmedian line nearer the distal margin; the black marks on the veins in the median area are obsolete, except at inner margin, on the other hand two dark dashes in the distal area, between the radials, are generally conspicuous. Japan, Loochoo and Chekiang. *obscuraria*.

N. polycommata *Schiff.* (= *hyemata* *Bkh.*) (6f). A handsome species and easily recognized by its *polycommata*. rather elongate forewing and by the form and arrangement of the rich, red-brown markings on the glossy, brownish-white wing. Hindwing with discocellulars biangulate, 2nd radial from lower angle. Not generally very variable; in typical examples, such as we figure, the distal area of the forewing shows a moderately distinct dark band or shade, set off by the pale subterminal. — In ab. **prospicua** *ab. nov.*, however, the white *prospicua*. ground-colour is scarcely dark marked, the median band somewhat darkened, in consequence showing up very clearly and effectively. I have only seen English examples. — ab. **albinea** *Tgstr.*, which I have not seen, is *albinea*. said to be almost entirely white, the forewing only with very little fuscous marking. If this was intended to denote the preceding form, the description is exceedingly bad. Finland. — Larva moderately stout, nearly cylindrical, but rather ridged and wrinkled laterally, anal points small; head rather small, rounded, green; body dark green with darker mediodorsal and slender whitish subdorsal line; lateral stripe narrow, white or pale yellow. On privet, or sometimes ash or honeysuckle, when young in the buds; full fed in June. Pupa of medium thickness, wing and leg-cases dull green, dorsum and abdomen yellowish red-brown, the former with slight greenish tinge anteriorly. In a moderately compact cocoon on the surface of the earth. The moth appears early in the following spring (March or April) and is found locally in Central Europe, S. Sweden and Russia.

N. coartata *Püng.* Apparently related to *polycommata*, perhaps on an average somewhat smaller, palpus *coartata*. decidedly shorter, distal margin rather more bowed. Forewing greenish grey with the dark markings arranged somewhat as in *polycommata*, the median band, however, divided into two throughout its entire course, thus enclosing a complete, pale central band, which is whitest at the inner margin; a fine dark discal dot in this pale band. Hindwing whitish grey with quite fine discal dot, the light band beyond the middle broader and more distinct than in *polycommata*. Underside of forewing pale grey, of hindwing whitish. Koko-Nor, Tibet.

exportata.

N. exportata *Stgr.* is unknown to me. If it is related in structure to *volitans expressata*, with which its author compares it, it must be removed to *Trichopterigia*, but no information on this question is given. Wings slightly narrower and more elongate than in *volitans*, the greenish tone entirely wanting. Forewing dirty dark grey with lighter and darker lines, the veins mostly dark, here and there spotted with white; median band broad but not distinct, being comparatively little darkened, while its central part remains nearly of the ground-colour; proximal margin of the band curved, without the projecting tooth near the hindmargin which characterizes *volitans*; on the costa near the apex stands a triangular darker spot; pale subterminal line broken into spots, little developed; a dark terminal series of double dots. Hindwing light grey, showing traces near the distal margin (especially in the ♀) of a darker line. Underside glossy grey, the forewing in the ♀ with a light band in the distal part. Askold and the Sutschan district, Ussuri. Possibly related to *grisearia*.

grisearia.

N. grisearia *Leech* (11c). Nearly related to *carpinata* and *hemana*. It has the same whitish ground-colour but the lines of the forewing (which are numerous and rather well expressed) are of a browner tone, with a tinge of olive; occasionally they are pretty evenly distributed over the wing, but usually in the median area they are condensed into a narrow proximal and broader distal band, the intermediate space remaining clear; outer area marked with series of roundish white spots, the third of which forms the subterminal line; between the subterminal and the margin the veins are rather strongly darkened, at least in the anterior half of the wing. Hindwing whitish grey with traces of a postmedian line or series of vein-dots. Under surface, especially of forewing, rather more smoky, very weakly marked. Japan.

carpinata.

N. carpinata *Bkh.* (= lobulata *Hbn.* = costaestrigata *Haw.* = dentistrigata *Haw.* = rupestrata *Steph. nec Schiff.*) (6 f, ♂; 6 g. ♀). Ground-colour whitish grey, in freshly emerged specimens with a very delicate green tinge; the markings somewhat darker brownish grey, but generally quite weakly expressed. Hindwing whitish, greyer distally, sometimes with one or two fairly well-defined grey lines not far from the distal

*fasciata.**obscurata.**unifasciata.*

margin. ♂ narrower-winged than ♀. — In ab. **fasciata** *Prout* the two central bands are very much darker, sometimes quite deep fuscous, giving the effect of a different species. Frequent in Perthshire. — **obscurata** *Sp. Schneid.*, described as a local race in Norway, is perhaps transitional towards ab. *fasciata*, as the bands and lines are said to be more distinct; the ground-colour, however, is also darkened, which is not the case with *fasciata*. — ab. **unifasciata** *Rbl.* is a development of ab. *fasciata* in which the two bands coalesce in their posterior part, leaving only a pale central part anteriorly, as in *polycommata*. — Larva of moderate length, rather flattened; head small; thorax and first abdominal segment with a slight lateral enlargement; colour green, with a bright yellow spiracular stripe; anal points yellow. On willow, birch, etc. in May and June. Pupa rather glossy, finely sculptured, wings smooth; colour red-brown. Hibernates in a small oval earth-mingled cocoon on the ground. The moth appears in April and sits on tree-trunks by day. Distributed and often common in Central and Northern Europe, Siberia and the Ili district.

germinata.

N. germinata *Püng.* Unknown to me and the neuration not described, but as the shape and structure are said to agree with *carpinata* it probably belongs to this genus. Rather smaller than *carpinata*. Forewing ash-grey with bent or angled subbasal brownish line, a second line similar, a narrow curved antemedian band, the discal mark elongate, forming a very sharply expressed, somewhat wavy black streak, postmedian narrow band strongly excurved round the cell-streak, slightly incurved in its posterior half, marked with black at the base of the 3rd radial and 1st median veins, 3 fine outer lines parallel to the postmedian, veins with blackish dashes towards their extremity. Hindwing light grey, in the distal part with 2 indistinct lines. Forewing beneath brownish grey, hindwing pale grey, both with elongate discal mark, hindwing with the 2 dark lines more distinct than above. Koko-Nor, described from a ♀.

hemana.

N. hemana *Btlr.* (= insontata *Chr.*) (6 g). Considerably smaller than *carpinata*, rather whiter, the lines of the median area curved outward at the posterior margin, terminating in two distinct reddish-brown spots placed at about one-half and three-fourths the length of the margin. These spots also distinguish *hemana* from *grisearia*, from which it further differs in the finer, clearer grey (not olive-brownish) lines, etc. Our figure is coloured too brown. Eastern Siberia and Japan. *STAUDINGER* (*Iris* vol. 10, p. 73) evidently received the wrong species as *hemana*.

terranea.

N. terranea *Btlr.* (12c) slightly recalls in its coloration some dark specimens of *polycommata* and the shape of the distal margin of the central band also resembles that of the species named; *terranea*, however, is very much smaller, duller, the costal part of the band only indistinctly pale in its centre, the proximal edge of the band very much straighter, etc. The ground-colour is dark greyish, the hindwing nearly as dark as in *sabinata*, the band dark reddish-brown or blackish-brown. Both in this and the following species, but perhaps especially in the latter, the costal vein of the hindwing is further removed from the subcostal than in most of the genus. Japan (Yokohama, etc.).

N. misera Btlr. (11 c). Nearly related to *terranea* but still darker. At the same time the ground-colour is much more mixed with brown, which shows up especially in the paler areas that precede and follow the central band; the band itself has its proximal edge rather strongly incurved, though not so strongly as in *polyommata*, and is of a dull blackish brown colour, apparently never reddish, rarely with conspicuously lighter patches in its middle; distal area in general more strongly marked than in *terranea*, at least with a distinct lunulate-dentate dark line following the outer pale band. Hindwing small, strongly darkened. Japan (Yokohama, etc.). *misera*.

N. rivularia Leech (12 a). Very distinct in coloration, etc. and probably forming a separate genus, in any case not a *Cryptoloba*, as described by LEECH. Except in the more hairy palpus (which is of moderate length) it agrees with *Nothopteryx* as here characterized. Recognizable at once by the black and white wings. W. China: Omei-shan, Ni-tou, Che-tou, Pu-tsu-fong, flying in June and July. *rivularia*.

26. Genus: **Lobophora** Curt.

Face smooth. Palpus short, rough-scaled. Antenna in both sexes simple. Hindtibia with 4 spurs, the inner of each pair in the ♂ long and slender; ♂ with hair-pencil. Forewing with areole double. Hindwing with discocellulars not biangulate, 2nd radial from the centre, costal anastomosing with cell to considerably beyond middle, 2nd subcostal in ♂ separate, in ♀ shortly stalked; ♂ with a large lobe, reaching fully half the length of the wing, 2nd median very short and weak, running to the inner margin, submedian wanting.

A quite distinct genus, differing from *Nothopteryx* in the 4-spurred hindtibia, anastomosis of costal vein and much more strongly developed lobe of ♂ hindwing. Only two or three species are known, inhabiting Europe, Siberia and North America.

L. halterata Hufn. (= hexapterata Schiff. = ? inequaliata Pack.) (6 f). Forewing whitish, with a very slight tinge of brown, at least in the central area; a narrow subbasal dark band, closely followed by conspicuous broader one, the pale line which separates them angulated anteriorly; the lines of the median area ill-defined, dentate. Hindwing white, nearly always with a narrow greyer distal border and sometimes with one or two indistinct lines in outer half. Forewing beneath very weakly but more uniformly marked; hindwing with very distinct discal dot. Variable in the intensity of the markings. — ab. **rudolphii** Lampa has the forewing much darker than in the type form, the median area little lighter than the rest. — ab. **zonata** Thnbg.¹⁾ (6 g) has the lines of the median area almost entirely obliterated, the dark markings in the proximal and distal areas on the contrary intensified. — Larva moderately stout, pale green, subdorsal lines pale yellow, conspicuous, other lines faint or wanting; anal extremity with two small points projecting backwards. On poplars, particularly *Populus tremula*, in June and July. Pupa short, very obtuse in front, tapering rapidly behind, copiously sculptured, wings glossy, yet densely covered with short lines, cremastral spike long, bifid, strongly hooked at the tip; dark red-brown, segment-incisions paler. In a compact cocoon of silk and earth. The moth appears early in May and may be found by day sitting on aspen trunks. It is widely distributed in Central and Northern Europe and Siberia and a few localities in Southern Europe. *halterata*. *rudolphii*. *zonata*.

27. Genus: **Mysticoptera** Meyr.

Like *Lobophora* in leg-structure and in the strongly developed lobe of the ♂ hindwing, but differing in the less smooth face, longer palpus, single areole, separation of the costal vein of the hindwing from the cell in the ♂ and other characters. The discocellulars of the hindwing are biangulate, the 2nd radial arising below the middle; the wing-lobe is fringed with long hair towards the inner margin; the 2nd median vein, as well as the submedian, is wanting in the ♂.

Only one species is known.

M. sexalata Retz. (= sexalisata Hbn. = hexaptera Latr.) (8 a). Generally not variable, but I have bred one ♀ in which the median area is considerably broadened and scarcely darkened, but shows rather distinct trasverse lines — recalling the arrangement in *halterata*. Larva moderate, nearly cylindrical, rather rugose, head rather narrower, anal points well developed; green with whitish dorsal and subdorsal lines, tips of anal points pink. Feeds in August and September on willow, generally at a good height from the ground. Pupa very thick; wings smooth and glossy, greenish; dorsal region and abdomen dark chestnut, covered with minute punctures; cremastral spike strong, forked and hooked at the tip. Hibernates, the moth appearing about June; it is said to be partially double-brooded, but I have no experience of this. Central and Northern Europe and S. E. Russia. *sexalata*.

¹⁾ Several recent authors, misled by an error of STICHEL's, have quoted SEBALDT and others as the authors of THUNBERG's species. The system under which the Swedish university professors worked was very unsatisfactory, but the true authorship is well understood in Sweden. See Journ. Botany vol. 51, p. 101.

28. Genus: **Otoplecta** Warr.

Characters intermediate between those of *Mysticoptera* and *Trichopterigia*, shape nearer to the former. Palpus long, rough-scaled. Antenna simple. Hindtibia with terminal spurs only. Forewing with areole single. Hindwing relatively larger than in most of the group; costal in both sexes anastomosing with cell; 2nd subcostal in ♂ separate, in ♀ shortly stalked; discocellulars biangulate; ♂ with submedian vein wanting, inner margin folded over from base to beyond middle, covering a pocked which opens to the upper surface.

This genus was established by WARREN for the present species, which is only known from Japan and shows no very close affinity with any other. Perhaps the earlier stages, which are at present unknown, will show whether it really belongs to the *Lobophora* group or whether — as the coloration would suggest — it is a much modified development of *Eulype*.

frigida.

O. frigida Btlr. (13b). Glossy white with black markings. Forewing with basal patch rather broad but mixed with white; median area also broad, broken into two bands which nearly meet at the costa; its proximal edge strongly curved, its distal projecting slightly about the 1st radial and acutely behind the 3rd radial; the white band which follows uniform in breadth throughout, containing a row of black dots; distal area almost entirely black, a very fine white subterminal line indistinct or nearly obsolete, but nearly always distinct at costal margin; fringe black, more or less white-spotted. Hindwing grey, with a white band not far from the distal margin, the area beyond it blacker, more or less intersected with white between the veins; a moderate black cell-dot. Underside similar, forewing less varied proximally. Japan, apparently common at Yokokama.

29. Genus: **Trichopterigia** Hmps.

Palpus with 2nd joint moderate or (especially in the ♀) long, shortly rough scaled. Antenna simple. Hindtibia with terminal spurs only. Forewing with areole single, broad. Hindwing in ♂ with small lobe, submedian vein wanting; in both sexes with discocellulars strongly biangulate, costal anastomosing with cell (except only in *volitans*, which is doubtfully congeneric), 2nd subcostal well stalked with 1st radial.

A development — chiefly Indian — from *Nothopteryx* or an allied form, differing in the single areole, usually also in the longer palpus and the neurulation of the hindwing. Entirely wanting in Europe, but a few species reach the Eastern Palearctic Region.

Early stages unknown.

volitans.

T. volitans Btlr. (= *expressata* Chr.) (8a) is aberrant in the non-anastomosis of the costal vein of the hindwing in the ♂, the scaling is rather denser than in most *Trichopterigia* and the facies more nearly that of a *Nothopteryx*. Ground-colour white, the forewing more or less heavily dusted with brown atoms but often with a broad, almost clear space remaining proximally to the median band and a second occupying the distal area from the 3rd radial to the hinder angle; basal area tinged with green, a fuscous subbasal line distinct; the succeeding area more or less clouded with fuscous; central area of moderate breadth or rather narrow, proximally with two strongly curved, closely approximated fuscous lines, filled-in with greenish, distally with two less approximated ones, the outer strongly lunulate-dentate, the space between them again filled-in with greenish, crossed by dark vein-marks; the area between these pairs of lines is very variable, almost entirely dark-fuscous or clouded with that colour or whitish, merely fuscous on the veins; apical area with the beginnings of some lines on the costa, then some greenish clouding, then a dark cloud between the radials; cell-dot fuscous. Hindwing whitish, usually with 2 or 3 faint grey postmedian lines. — ab. **elegans** Butl. has the fuscous lines and vein-marks of the median area thickened, so as largely to supplant the greenish shade, while the central part of this area remains white, crossed by thick fuscous lines on the veins. Yokohama. — *volitans* inhabits Japan and East Siberia; CHRISTOPH found it in numbers at Nikolsk in the first half of April, sitting on the tree-trunks in oak woods.

elegans.

consobrinaria.

T. consobrinaria Leech bears some slight resemblance to *Acasis viretata*, a small form of which we have in error figured under this name. *consobrinaria* however, irrespective of the structural differences, has the forewing of a paler and less bright green, the median area divided into two bands nearly as in *Nothopteryx grisearia* or well-marked forms of *carpinata*, its boundary lines (especially the proximal) much less jagged than in *viretata*, the markings in the distal area different and the hindwing white. Size of the preceding, forewing with distal margin less oblique, proximal and distal areas pale delicate greenish, centre of median area whiter; antemedian and postmedian bands crossed by dark vein-dashes. Hindwing white with the veins, a curved

postmedian line, a distal border and the fringe vaguely brownish. Forewing beneath more smoky, the bands a little darkened. Japan, the type ♂ from Gifu.

T. costipunctaria *Leech*. (11 d) is much larger, rather ample-winged and nearly agrees in coloration and facies with the typical Indian section of the genus, the forewing being marked with red. Forewing dirty pale yellowish, probably discoloured from greenish. Hindwing white, with faint cell-dot and with the inner margin narrowly concolorous with the forewing and black-dusted. Both wings beneath nearly as above, the red markings greyer. Japan: Gifu, only the ♀ known. *costipunctaria*.

T. rufinotata *Btlr.* (13 a). Size of the preceding but very distinct in markings. Forewing very pale yellowish grey, somewhat dark-dusted, especially in median area; a dark subbasal line, angled on median vein and outbent at inner margin, where it runs into a deep black streak; median band very vaguely indicated by two groups of lines which are partly obsolete; at the costal margin they are all distinct (3 antemedian and 4 postmedian), the postmedian are angled at the 1st radial and one or two continue to be traceable, parallel with the distal margin; posteriorly to the median vein some distinct antemedian lines reappear and run, closely approximated to the postmedian, to the hindmargin, becoming very oblique and very black behind the submedian vein; a double (partly triple) undulate, dark subterminal line, distally to which stands a series of round internervular orange-red spots, those between the radials and between the medians being large and conspicuous. Hindwing dirty whitish with weak brownish subterminal lines which become strong at the costa and a dark uninterrupted terminal line. Under surface similarly but more vaguely marked. Kulu. A rather darker example from Yatung, Tibet, is also before me. *rufinotata*.

30. Genus: **Emmesomia** *Warr.*

Face smooth. Palpus very short, with appressed scales. Tongue developed. Antenna in ♂ thick, lamellate, minutely ciliated. Hindtibia in both sexes with all spurs, ♂ with long, slender hair-pencil. Forewing with apex strongly falcate, distal margin deeply excised anteriorly, roundly elbowed in middle, then straight and very oblique; areole double. Hindwing rather narrow, produced at end of 2nd subcostal, thence rather straight to anal angle, only slightly waved and slightly outbent about the 3rd radial; costal rather remote from cell, connected by an oblique bar about middle; cell very short, 2nd subcostal remote from 1st radial in ♂, very shortly stalked in ♀; discocellulars not biangulate, 2nd radial central in ♀, near 3rd in ♂; 1st median from near 3rd radial, 2nd median and submedian wanting in the ♂, which has the inner margin folded into a sort of pocket at the base.

This genus was established by WARREN for an Indian species, *E. bilineata*. It is structurally near the following but very distinct in the shape of the wings. The only two known species are closely related. Assam and West China.

E. bilinearia *Leech* (= *parallelaria* *Leech*) (12 a). Pale whitish brown tinged with ochreous. Under surface more ochreous, forewing with cell-spot, both wings with postmedian line. Ta-chien-lu, W. China, 2500 m., collected in May and June. Rather smaller and paler than *bilineata*, which moreover has the lines of the forewing broader and brighter and lacks the discal spot. *bilinearia*.

31. Genus: **Heterophleps** *H.-Sch.*

Face smooth. Palpus short or quite moderate, rough-scaled beneath. Antenna in ♂ with paired fascicles of moderate or long cilia (section *Heterophleps*) or with slender, well-ciliated pectinations (section *Lygranoa*). Hindtibia in both sexes with all spurs. Forewing broad, with areole double. Hindwing relatively small, in both sexes with the costal vein separate from the cell, connected by a slender, oblique bar just beyond the middle, discocellulars not biangulate; ♂ with 2nd subcostal remote from 1st radial, 2nd and 3rd radials arising near together from posterior part of cell, 1st median sometimes obsolescent, 2nd median and submedians entirely wanting, the inner margin cut away, fringed with dense hair but without lobe or pocket; ♀ with 2nd subcostal approximated or short-stalked, 1st median approximated or short-stalked, inner-marginal area not aborted.

An exceedingly natural genus, the affinity extending even to the colour and markings, the triangular costal spots at the origin of the lines being characteristic. Although local in distribution and not very rich in species it is found in 3 of the great faunistic regions and in each has received a different name. In N. America

it is called *Heterophleps* *H.-Sch.*, in the Palearctic Region *Lygranoa* *Btlr.* and in India *Dysethia* *Warr.* It only varies in the ♂ antennal structure.

A. Section *Lygranoa* (= *Dysethiodes*). ♂ antenna pectinated.

fusca. **L. fusca** *Btlr.* (6 d). Forewing brown, the lines often scarcely appreciably darker, but arising from strong black costal marks; the antemedian mark is slightly oblique outwards and reaches into the cell; the postmedian is broader from costa to just beyond the 5th subcostal, then very slender and very oblique outward to the 1st radial. Hindwing scarcely paler, unmarked or with faint sinuous line just behind the middle. Under surface nearly unmarked, hindwing paler than above. Japan, Ussuri, Korea and China.

B. Section *Heterophleps* (= *Dysethia*). ♂ antenna ciliated.

pallescens. **H. pallescens** *Warr.* (11 d, as *pulveraria*; 11 e). Larger and paler than *fusca*, the costal spots more brownish black, perhaps in general rather smaller (at least the postmedian) the antemedian line less incurved in cell, the postmedian less sharply angled at the 1st radial, both marked with dark teeth on the veins. Hindwing with postmedian line angled outwards behind 3rd radial and inwards on the fold. Underside rather more yellowish. Japan: Oiwake. The shape varies, but our figure 11 e exaggerates the tooth in the margin of the hindwing.

sinuosaria. **H. sinuosaria** *Leech.* (11 c). Size of *pallescens*, ground-colour of forewing less uniform than in the two preceding, being bright brown, clouded with darker in the basal and distal areas and in the middle of the wing. An antemedian oblique dark line rather near base, sharply angled outwards on the fold; discal mark elongate; postmedian costal spot large, the line from it finely sinuate; postmedian pale line strongly lunulate. Under surface with distinct cell-marks and postmedian line. Ta-chien-lu, July.

confusa. **H. confusa** *Wileman* (= *fusca* *Meyr.*, nec *Btlr.*) (11 d). Size of *fusca*, darker brown, the antemedian black costal spot vertical or very slightly oblique *inwards*, the postmedian scarcely so acutely angled anteriorly, less sharply defined between 5th subcostal and 1st radial, distal margin of forewing more bent in the middle, of hindwing more convex (rounded) about the 3rd radial. Still more sharply distinguished by the structural characters; in addition to the antennal difference, the inner margin of the ♂ hindwing is less cut away, the 1st median vein well developed, occupying the same position as the 3rd radial of *fusca* (i. e. running to the anal angle), the 2nd subcostal less remote from the 1st radial. Japan: Hondo and Yezo, May—July.

C. ♂ unknown.

grisearia. **H. grisearia** *Leech* (11 d). Size of *pallescens* and *sinuosaria* and probably referable to section B. Apparently nearly related to *sinuosaria* but of a quite different colour, pale violet-grey, dusted and clouded with brown. Forewing with first costal spot larger and more regularly triangular than in the other species, second blotch nearly as in *sinuosaria*; discal dot very small; antemedian line nearly vertical on hindmargin, here strongly marked, but becoming obsolete; postmedian chiefly marked by dots on the veins; subterminal much interrupted. Pu-tsu-fong and Kia-ting-fu, W. China, June—July.

32. Genus: **Sparta** *Stgr.*

Face smooth. Palpus exceedingly minute. Tongue rudimentary. Antenna in ♂ bipectinate with long branches, in ♀ simple. Hindtibia with all spurs. Frenulum wanting. Forewing with costal margin nearly straight, distal margin nearly as long as costal, curved posteriorly, hindmargin extraordinarily short; areole double. Hindwing extremely small and narrow, costal vein remote from cell, connected by an oblique bar rather near the base, cell rather short and narrow; ♂ with 2nd subcostal and 1st radial from apex of cell or very shortly stalked, 2nd median and submedians wanting, inner margin with a small lobe at base, formed into a sort of pocket; ♀ with all veins, submedian short, 2nd subcostal rather long-stalked.

A very curious genus, containing only a single species, which seems to show a relationship to the South American *Dyspteris*. According to DAMPF, LEDERER's name for this genus and species (*Celonoptera mirificaria*) seems to have been published before STAUDINGER's; the part of the Berl. Ent. Zeitschr. containing the former is dated May, 1862, that of the Stett. Ent. Zeit. Apr.—June, but STAUDINGER writing to MILLIÈRE in 1863 says the latter really appeared first. Exact contemporary evidence is needed.

S. paradoxaria *Stgr.* (= *mirificaria* *Led.*) (6 c). Forewing uniform dull green, beneath somewhat lighter *paradoxaria*. and more yellowish green. Hindwing above and beneath paler, almost whitish. From the similarly but more brightly coloured *Leptostegna tenerata*, and indeed from all known species, the shape at once distinguishes it. Only known from Greece and Sicily.

33. Genus: **Leptostegna** *Chr.*

Face smooth, rounded. Palpus minute. Tongue developed. Antenna in ♂ dentate, with fascicles of short cilia, in ♀ simple. Hindtibia with all spurs. Frenulum wanting. Forewing with areole single. Hindwing with costal separate from the cell, connected beyond the middle by an oblique bar, which may be regarded as the 1st subcostal, usually absent, but here separating again from the costal near the apex, 2nd subcostal long-stalked with 1st radial, discocellulars biangulate, 2nd median present, running to anal angle, submedians absent, the inner area of the wing being somewhat reduced. The only known species is Asiatic.

L. tenerata *Chr.* (6 c). Forewing green, rather thinly scaled, with indistinct white antemedian, postmedian and subterminal lines and very small white cell-dot. Hindwing white, becoming greenish in distal half. Underside similar, hindwing slightly greener. Japan, Korea and E. Siberia. — **asiatica** *Warr.*, from W. China *asiatica*. and N. India, is on an average somewhat larger, the distal margin of the forewing more oblique, of the hindwing straighter in the middle, the forewing slightly more mixed with whitish, the white lines and dot more sharply expressed, the lines more lunulate, hindwing also rather better marked. Possibly a distinct species.

34. Genus: **Ptygmatophora** *Gmpbg.*

Face smooth. Palpus short, rough-scaled beneath. Antenna in both sexes simple. Hindtibia with all spurs. Forewing with areole double. Hindwing in ♂ with costal area greatly expanded, inner-marginal part specialized into a deep, hairy, furrowed fold, costal vein well separate from subcostal, connected by a bar about the middle of the cell, which is short, 2nd subcostal short-stalked with 1st radial, 2nd radial closely approximated to 3rd.

This genus, first named *Ptygmatophora* by GUMPENBERG, was renamed *Bessophora* by MEYRICK 5 years later. Only the type species is known, coming from Eastern Asia.

Pt. staudingeri *Chr.* (6 b). Easily known by its bright golden orange ground colour and heavy black *staudingeri*. spotting, rather recalling some of the *Abraxas* group of the *Geometrinae*. The size, shape and exact position of the black spots varies slightly. Under surface like upper. Amur and Korea.

35. Genus: **Microloba** *Hmps.*

Face smooth. Palpus rather short, rough-scaled. Antenna in both sexes strongly pectinate. Hindtibia with all spurs. Frenulum present. Forewing with areole single. Hindwing relatively small, especially in the ♂; costal in both sexes anastomosing with subcostal to beyond the middle of the cell; 2nd subcostal in ♂ remote from 1st radial, 1st discocellular almost vertical, 2nd radial from near 3rd, inner-marginal area reduced, folded; ♀ neuration normal, 2nd subcostal short-stalked.

Of this genus also only one species is known, inhabiting Eastern Asia.

M. bella *Btlr.* (= *eburneata* *Chr.*) (6 d). Easily recognizable from our figure. Underside similar to *bella*. upper, but the proximal two-thirds of forewing somewhat darkened and more strongly marked than above. Japan, Korea, E. Siberia and China.

36. Genus: **Brabira** *Moore.*

Face smooth. Palpus longish, rough-scaled. Antenna in ♂ bipectinate, in ♀ simple. Hindtibia with all spurs. Forewing ample; areole double. Hindwing small, the distal margin excised between the 2nd subcostal and 2nd (or 3rd) radial, the inner margin in the ♂ with a large fold at the base, costal anastomosing

shortly with subcostal at the end of the short cell, in the ♀ anastomosing normally; 1st radial in ♀ long-stalked with 2nd subcostal, in ♂ coincident; ♀ with all veins, ♂ without medians and submedian.

Besides the species here given, only one or two Indo-Australian species are known.

artemidora.

B. artemidora Ob. (= *pallida* Moore) (6c). Greyish white, slightly suffused with brown. Forewing with black costal markings somewhat as in *Microloba bella*, black cell-spot and waved whitish antemedian, postmedian and subterminal lines, the two former indistinctly dark-edged proximally and distally, the latter with interrupted dark shading proximally. Hindwing usually with two thick dark lines in proximal half, obsolete costally, towards inner margin often united by a dark blotch; some indistinct dark markings before the pale subterminal.

Inhabits Japan, the Ussuri district, Formosa and North India.

37. Genus: **Sauris** Guen.

Face smooth. Palpus very long, with appressed scales. Antenna in ♂ somewhat thickened and flattened. Hindtibia in ♂ without spurs, in ♀ with a single pair. Abdomen long. Forewing rather long and narrow; areole single. Hindwing small, in the ♂ usually much distorted, with large basal lobe and in the typical section with the distal part irregularly folded and clothed with curved hair; ♀ with all veins, costal anastomosing with cell, 2nd subcostal stalked, ♂ with fewer veins, their homologies difficult to decide on account of their abnormal position, probably the medians and submedians wanting, costal anastomosing with subcostal or anastomosing beyond the end of the cell, 1st radial widely separate, 2nd radial from lower angle of cell, 3rd from near 2nd.

A somewhat extensive Indo-Australian genus or group of genera, only straggling into the Palearctic and Aethiopian regions. It is evidently an offshoot of the *Lobophora* group and is remarkable for the very long palpi, the spurless ♂ hindleg and especially the various extraordinary modifications of the ♂ hindwing. The only Palearctic species known to me are the two from Japan which are here described; little is known concerning them, indeed the type specimen of *minuta* (unfortunately without exact locality and in poor condition) remains unique. Both are probably confined to the South of the country.

*nigriline-
aria*

S. nigrilinearia Leech (12a). ♂♀ 33 mm. Forewing pale dull green with irregular, somewhat broken, blackish costal marks at the beginnings of the principal lines; the lines themselves wavy, very weakly expressed in rather darker green; subbasal slender, bent at subcostal; antemedian slightly marked with blackish in anterior half; an oblique black discal dash; postmedian double; a very conspicuous dark line from costa 3 or 4 mm before apex to near hinder angle, a second, less strong, slightly interrupted, close to distal margin; on these lines and (except from costa to 1st radial) between them a strong purple-brown shading. Hindwing above and beneath uniform glossy reddish grey; forewing beneath of the same red-grey, some of the markings faintly showing through, especially the strong black subterminal line. Japan: the type (♀) collected by PRYER and without exact locality; Kagoshima, 2 ♂♂ in early July (WILEMAN). Related to *abnormis* Moore from India, but with the lobe on the hindwing very much larger, reaching fully to the end of the cell.

minuta.

S. minuta Leech ♂, 22 mm. May be distinguished by its small size and dark colour, but is too worn to allow of a complete description. Ground-colour of forewing in fresh specimens probably green in the proximal part, certainly violet-tinged in the distal, but strongly dusted and marked with fuscous; numerous wavy transverse lines in proximal three-fourths, then a narrow violet-whitish band, outcurved and bisected anteriorly, broader and clearer posteriorly; the area between this band and the white subterminal line (which is very near the termen) olive-green from costa to 1st radial, then fuscous. Hindwing with rather strong basal lobe; uniform brown-grey. Underside uniform brown-grey. Japan.

38. Genus: **Cryptoloba** Warr.

Face with projecting cone of scales. Palpus rather long, rough-scaled. Antenna in ♂ and sometimes in ♀ bipectinate. Hindtibia with all spurs. Forewing with areole single (perhaps variable in *aerata* Moore). Hindwing with costal vein in both sexes connected with the cell by a short bar, 2nd subcostal stalked or from or shortly before the apex of the cell, discocellulars biangulate, 2nd radial usually arising near 3rd; submedian veins in ♂ wanting, the inner margin of the wing being modified into a small lobe at the base.

An Indian genus of which the type species (*aerata* Moore) apparently does not reach the Palearctic Region. Even the two species here described only just enter it.

C. cinerea *Btlr.* ♀ antenna pectinated. Expanse about 20 mm. Forewing rather pale glossy leaden-grey, costal edge ochreous, black-spotted; two waved, parallel brown lines, at about one-third and two-thirds, both marked with black from costa to 1st radial and with some smaller, finer black dashes or dots at the other veins or some of them — a postmedian pair on the 3rd radial and 1st median the best developed. Hindwing paler, unmarked. Forewing beneath darker lead-colour, becoming paler and more ochreous costally, the lines wanting. The typical form I have only seen from Sikkim; Dharmasala specimens are darker lead-colour, especially on the hindwing and should probably be separated as a local race. *cinerea*.

C. apicata *spec. nov.* (= *cinerea* *Leech* nec *Btlr.*). Smaller than *cinerea* (17 mm), the forewing appearing rather more pointed, on account of a very faint concavity in the anterior half of the distal margin and blackish spots on the fringe at the apex and the 3rd radial; a quadrate brown costal blotch at the origin of the postmedian line, the spot at the origin of the antemedian also somewhat enlarged; fringe, in addition to the large spots above mentioned, somewhat dark-spotted at the ends of the other veins, at least posteriorly. Hindwing narrow, with rather larger lobe than in *cinerea*; darker grey than in the typical form of that species. Chang Yang, July, type in coll. Brit. Mus. *apicata*.

39. Genus: **Lobogonia** *Warr.*

Nearly related to *Cryptoloba*, differing chiefly in that the distal margin of each wing has an angular projection at the 3rd radial and that the discocellulars of the hindwing are not biangulate and the 2nd radial arises from their centre.

India to China, scarcely really Palearctic.

L. ambusta *Warr.* (11 d). Light brown, the costal edge of the forewing and shaft of antenna rather copiously spotted with black. Forewing with black spots at costa, somewhat as in *Heterophleps* but smaller. Underside brighter yellow-brown, suffused with reddish and coarsely dusted with fuscous, both wings with a strong thick postmedian line. Described from the Khasis, but occurs at Pu-tsu-fong and Omei-Shan in July. *ambusta*.

L. parallelaria *Leech* (11 d) differs markedly from the more typical species in having the distal margin of the hindwing almost smooth, not angulated. Paler than *ambusta*, the lines of the forewing further apart, very straight, only a little widened at the costa and not black-marked; a round submarginal spot between the 1st and 2nd radials; terminal line and fringe dark almost to the hinder angle. Hindwing with the postmedian line much nearer the distal margin than in *ambusta* and *conspicuaria*. Ichang, June, only LEECH's type (a ♀) known to me. Doubtfully distinct from *olivata* *Warr.*, described a year earlier from the Khasis. *parallelaria*.

L. conspicuaria *Leech* (11 d) differs from *ambusta* in having the first and second black costal spots larger and triangular, the apex of the outer one extending as far as the dark spot which follows the postmedian line and which is also enlarged; the antemedian line not clearly defined, the postmedian interrupted in its posterior part. The single line of the hindwing is broader and the entire wing more coarsely speckled or strigulated with fuscous. Chang Yang in August. *conspicuaria*.

L. pseudomacariata *Pouj.*, described from a single ♀ from Mou-pin, is only known to me from the figure and description, but is certainly a close ally of *conspicuaria*, which will perhaps have to sink as a local form of it. Ground-colour perhaps slightly paler, postmedian line of forewing widened into a narrow band, continued to hindmargin though becoming still narrower; the single line of the hindwing, on the contrary, obsolete in its anterior half; distal margins and fringes apparently less strongly blackened. *pseudomacariata*.

L. fasciaria *Leech*, founded on 2 ♀♀ taken at Chang Yang in June and July, has the margin of the hindwing shaped as in *parallelaria*. It is smaller and much more heavily marked. Forewing pale yellowish brown, coarsely speckled with fuscous; the lines moderately approximated, arising from elongate costal triangles, thick throughout most of their course but somewhat interrupted (the antemedian behind the cell, the postmedian at both folds); two spots on costa near apex, a moderately large one at distal margin between the 5th subcostal and 1st radial and small ones in the other anterior cellules; submarginal spots between the 1st and 2nd radials and on each side of the fold. Hindwing rather paler, with a thick postmedian (median) line. *fasciaria*.

40. Genus: **Carige** Walk.

Palpus rather long, rough-scaled. Antenna in both sexes bipectinate, the branches in the ♀ shorter. Hindtibia with all spurs. Wings shaped nearly as in *Lobogonia*, distal margin of forewing sometimes little bent in middle. Forewing with areole single. Hindwing with costal vein connected with cell by a bar rather near base; cell short, discocellulars very oblique, in the ♂ biangulate; 1st radial stalked, 2nd in ♀ central, in ♂ from nearer 3rd radial; submedian wanting in ♂, a small lobe at base of inner margin.

Another small genus, ranging from India, Perak and Flores to Japan. It scarcely differs from *Lobogonia* except in the pectinated ♀ antenna and some small differences in hindwing neuration — ♂ discocellulars and 2nd radial and separation of 3rd radial and 1st median, which in typical *Lobogonia* are stalked.

- duplicaria*. **C. duplicaria** Walk. (= *nigronotaria* Brem., *irrorata* Btlr.) (7f). Pale yellowish grey, the lines somewhat yellower, but chiefly indicated by double series of dark dashes which edge them proximally and distally.
- extremaria*. Underside similar. Japan, E. Siberia and China. — **extremaria** Leech from Chang Yang, Central China, is a larger form, with the apex of the forewing more produced, the distal margin of the hindwing more deeply excised and the markings larger and blacker. In Western China, however, somewhat intermediate forms occur, of the size and colour of the type but shaped like *extremaria*.
- absorpta*. **C. absorpta** Warr. differs in its somewhat smaller size and the absence of the characteristic dark markings, being merely pale ochreous with fine, curved, slightly crenulate antemedian and postmedian brown-grey lines and brown cellspot; fringes glossy brown-grey. Japan.
- flavidaria*. **C. flavidaria** Leech (11d) differs from *duplicaria* in having the forewing in places clouded with yellowish, the veins broadly yellowish, the lines broader and deeper yellow, the paired black lines interrupted except at the margins, the antemedian placed nearer to the black discal dot; subterminal whitish, thicker, lunulate-dentate, interrupted. Omei-shan.

41. Genus: **Naxidia** Hmps. n.

Face rounded, smooth-scaled. Palpus very short, smooth-scaled. Tongue developed. Antenna in both sexes simple. Hindtibia with all spurs. Wings moderately broad, smooth-margined. Forewing with areole single. Hindwing with costal connected with cell by a bar in the middle; 2nd subcostal separate; discocellulars weakly biangulate, 2nd radial from slightly below the middle.

Only three species are known, chiefly North Indian, easily recognized by their pattern, which consists entirely of black dots on a white or whitish ground.

- punctata*. **N. punctata** Btlr. (7f). Forewing dirty white with four rows of black dots, the general arrangement of which can be seen in our figure. Forewing beneath suffused; hindwing rather more whitish than above, with cell-dot and angled postmedian line. N. India to W. China, scarcely penetrating into the essentially Palearctic Region.
- irrorata*. **N. irrorata** Moore (11e). Forewing less white than in *punctata*, being densely though finely powdered with grey; the black dots smaller, the postmedian series less deeply inbent at the 2nd median vein, the subterminal series more irregular, or interrupted, appearing as proximal filling-in of a subterminal line of white lunules. Hindwing rather less unicolorous above, showing traces of the angled postmedian; sharply marked beneath, the cell-dot large. N. India and W. China. The only Chinese example which I have seen (from Tachien-lu) has the ground-colour itself somewhat darkened, pale grey instead of white, possibly indicating a local race.
- maculata*. **N. maculata** Btlr. (11e). Rather smaller on an average than *punctata*, the spots almost identically placed but larger. Especially distinctive is the large, round discal spot of the forewing, with no surrounding dark shading. Discal dot of hindwing also somewhat enlarged. Japan.
- phryganea*. **Thysanodes** (nom. praeocc.) **phryganea** Rbr., founded on a single ♂ in bad condition which was said to have been taken at Touraine, has not occurred again and is suspected of having been an exotic species accidentally imported, but its determination has not yet been made out. Face smooth, palpus and tongue very small, antenna slender, subcrenulate and ciliated, nearly as in *Operophtera brumata*; legs long and slender with moderate spurs. Wings long, very narrow, coarsely scaled and with long fringes; forewing lanceolate,

areole single, long, 1st radial stalked; hindwing spatulate, a little truncate at the outer margin, which projects a little in the middle, frenulum nearly obsolete, probably non-functional, the base of the wing with a costal expansion, costal vein anastomosing with cell, 2nd subcostal stalked. Wing-expanse 29 mm, colour entirely reddish-brown, paler on the disc and at the base of the hindwing, with a slight golden reflection. The author compares the neurulation etc., with *Operophtera* and suspects that the ♀ might be apterous.

42. Genus: **Malacodea** *Tgstr.*

Face flat. Palpus minute. Tongue vestigial. Antenna in ♂ with joints slightly projecting, furnished with long slender cilia. Hindtibia with a single pair of short spurs. Wings rather delicate, thinly scaled. Frenulum wanting. Forewing with cell rather long, areole double, both parts long, the dividing vein (2nd subcostal) arising close to the end of the cell or even stalked, 1st radial stalked, 2nd arising from the middle of the discocellulars. Hindwing with cell long, costal anastomosing to near its end, discocellulars biangulate, 2nd radial arising rather near 3rd. ♀ unknown, probably wingless.

This interesting genus contains only a single Arctic species. It is certainly related to *Operophtera*, but differs in some important characters.

M. regelaria *Tgstr.* (12a). Pale brownish grey, glossy, the markings darker brown. Forewing with the median vein and its branches and the three radials darkened; subbasal line angulated, antemedian double, bent outwards in middle so as to approach the postmedian, the central area in consequence narrow posteriorly, sometimes constricted to a point on the 2nd median and on the fold, enclosing a rounded spot between; postmedian and the succeeding lines angled near costa, thence nearly parallel with distal margin, undulate; cell-spot distinct. Hindwing with smaller cell-dot and weak postmedian lines. Underside the same, or slightly weaker-marked. Lapland and St. Petersburg in May. Rare. *regelaria.*

43. Genus: **Operophtera** *Hbn.*

Characters as given under *Malacodea*, with the following differences: Hindtibia with all spurs. Forewing with areole single, though very long, discocellulars of this wing as well as of hindwing biangulate, with the 2nd radial arising from the lower angle. ♀ antenna simple, tongue slightly better developed than in the ♂, wings rudimentary, forewing at most as long as the body, sometimes much shorter, its posterior margin longer than its anterior; in the North American representatives (subgenus *Rachela* *Hulst*) entirely apterous.

The early stages of some of the species are only too well known, being among the greatest enemies of the fruit-grower and the forester and an enormous literature has been devoted to their study and the means of their destruction. The eggs are laid under bark or on twigs and buds in the winter and the young larvae hatch early in the spring, burrowing at first into the tenderest shoots, but later feeding indiscriminately on leaves or flowers. The ♀ being incapable of flight, great numbers can be caught and killed on the tree-trunks by means of rings of cart-grease, but evidence is accumulating that the ♂ sometimes carries the ♀.

The species inhabit Northern and Central Europe, with a few more southerly localities, parts of Northern Asia and North America.

O. fagata *Scharfenb.* (= *boreata* *Hbn.*) (6 e, as *boreata*). On an average rather larger than *brumata*, *fagata*. but always readily distinguishable in the ♂ by its paler, less yellow-brown forewing and whitish hindwing and in the ♀ by having the wings almost as long as the body, the forewing with a conspicuous blackish band or double line just beyond the middle. — ab. **fasciata** *Petersen* has the distal part of the median area of the forewing and a corresponding line on the hindwing considerably darkened, giving it a somewhat banded appearance. Underside also much more sharply marked than in the type. — The egg is very distinct in shape from that of *brumata*, being cut off flat at one end; the pitting is much deeper and more irregular and the colour more orange. The larva feeds chiefly on birch, in some districts also on beech, spinning up a leaf for a habitation; in its earlier stages it is distinguished from that of *brumata* by its darker (at first blackish) green colour and black head, but at its last moult changes materially, now differing in its lighter *yellowish* green colour and black head and legs; the subdorsal line is much broader than in *brumata*. *fagata* larva is full fed in early June and pupates in a compact cocoon mixed with earth. Pupa light brown, cremastral projection broader than long, ending in two hooks. The moth emerges in October and the beginning of November and although somewhat local is often to be found in great profusion by night among birch trees. Central and Northern Europe and S. E. Russia. *fasciata.*

- brumata*. **O. brumata** L. (= *hyemata* Hufn., *grisearia* Vill., *vulgaris* Steph.) (6e). Light brown, the forewing darker-dusted and with numerous wavy dark transverse lines of varying intensity, the discal dot minute or nearly obsolete; hindwing and under surface weakly marked. — ab. **huenei** *nom. nov.* (= *hyemata* Huene nec Hufn.) has the basal and median areas of the forewing darkened into bands. In extreme (but very rare) cases the intermediate area is also dark, so that the entire proximal half (or more) of the wing is differentiated in colour from the distal. Hindwing and underside also somewhat more banded than in the type form. — ab. *unicolor*. **unicolor** Lambill. is an entirely unicolorous form, the lines and even the discal dot being suppressed. — *myricaria*. **myricaria** Cooke is a smaller form, of a more purplish brown colour than the type and rather rougher-looking, but similarly marked; the difference in colour still more noticeable on the under surface. ♀ with shorter wings than in the type, sometimes more weakly marked. Several were bred from or taken amongst *Myrica* gale at Keswick, England, in January, the variation possibly local or seasonal. — Egg a fairly regular oval, about twice as long as broad, the surface regularly covered with very shallow, uniform depressions; light green at first, but red later. Larva lighter or darker green, sometimes even brownish- or blackish-green, darkest dorsally, with fine white subdorsal line and yellowish lateral stripe; head and legs nearly concolorous with body. Polyphagous on trees and very fond of fruit-trees, often excessively abundant, destroying alike leaves and blossom; full-feed in May and June. Pupa in a compact cocoon mixed with earth; light brown, cremastral projection somewhat T-shaped, the base of the T twice as long as broad. HAVERHORST's figure (Tijd. v. Ent. vol. 53, t. 17, f. 76) is incorrect or was possibly taken from an example of *fagata*. Imago throughout the late autumn and winter, the largest emergence in November and December. Central and Northern Europe, S. W. France, N. Italy, S. E. Russia, Transcaucasia and N. E. Amur. There is said to be also a local race in Castile, but I have no knowledge of it.
- tenerata*. **O. tenerata** Stgr. closely approximates to *brumata* in form and markings but is much smaller and of a darker grey colour, without the yellowish or brownish admixture of the European species. The veins are in places dark-marked, particularly where they cross the lines, but this is also observable in some aberrations of *brumata*. In the only example before me the lines in the distal part of the hindwing are better expressed than in *brumata*. Koko-nor, only the ♂ yet known.
- relegata*. **O. relegata** Prout (= *nexifasciata* Leech nec Btlr.) (8b). Larger than the other species and in general rather more strongly marked, distal margin of forewing rather straight. Antemedian line straight, not curved as is otherwise nearly always the case in the genus; the first of the postmedian lines strongly sinuous, nearly always more sharply defined than in the 3 preceding species; a black subapical streak present, which is entirely wanting in them. Underside similar to the upper but more weakly marked. ♀ unknown. Japan.
- japonaria*. **O. japonaria** Leech (8b). Nearest to *relegata* but very distinct from all the other species, distal margin rather more oblique. Rather variable in colour, sometimes of a similar tone to *relegata* or slightly more brownish, sometimes clearer whitish with rather strong fuscous markings. Forewing marked with black along the basal part of the 2nd median and with an X-shaped mark formed by the blackening of the end of the 3rd discocellular and of the median and the beginnings of the 3rd radial and 1st median (which are connate); a dark subapical streak as in *relegata*. Under surface very weakly marked. ♀ with forewing about as long as abdomen, costa arched, hinder angle acutely produced; veins and base of costa black; a subbasal line, angulated on median vein, an antemedian line placed almost in the middle of the wing, a postmedian midway between this and termen: hindwing much smaller and narrower, perhaps crippled in the only known specimen. Japan.

44. Genus: **Oporinia** Hbn.

Related to the preceding genus but with tongue and frenulum developed and the ♀ fully winged, though usually slightly smaller and sometimes narrower-winged than the ♂. Face, palpus, legs and hindwing as in *Operophtera* (only the palpus less extremely short), forewing neuration more as in *Malacodea* (areole double, discocellulars normal), scaling rather thicker; cells not unusually long.

Egg rather thick-shelled, red, the surface more or less deeply pitted throughout; passing the winter. Larva on various trees, stout or moderate, smooth; feeding up rather rapidly in the spring, exposed, not spun up like that of *Operophtera*; they undergo 4 moults. Pupa in a compact cocoon on or just below the ground. The moths appear in the autumn, chiefly about October, but in northern latitudes their appearance is hastened (August—September); in the form *filigrammaria* also, of which the larva is able to begin feeding before the trees are in leaf, the time of appearance is about August—September. Geographical distribution as that of *Operophtera*.

A very natural genus, the species all closely related and often difficult to distinguish. LEDERER merged it in his *Cidaria* and MEYRICK (scarcely less happily) in *Asthena*. The smooth, flat face distinguishes it from the *Cidaria* group, the strongly biangulate discocellars of the hindwing from *Asthena*. Those systematists who have recognized it have usually called it *Epirrita* (Hbn., Tent.) or *Oporabia* (Steph.).

O. dilutata Schiff. (= *inscriptata* Don., *neglectata* Weaver) (9 f), the name-type of the genus, is probably *dilutata*. the commonest species in Central Europe, though further north and east it is largely supplanted by *autumnata*. ♂ antennal joints projecting anteriorly, the antenna thus appearing thicker than in ♂ *autumnata*; ♂ genitalia with a hook on the harpes. Wings dirty white, with somewhat of a yellowish tinge, less strongly glossy than those of *autumnata*. Forewing with numerous waved dark lines of varying distinctness, those of the median area grouping themselves into 2 proximal and 3 distal, each group somewhat filled-in with brown shading, but rarely so sharply differentiated as in *autumnata*; subbasal line rather thick, gently curved or more strongly bent but rarely with the acute angle of *autumnata*; antemedian strongly excurved in middle, rather irregular; postmedian (i. e., the first and usually the finest and blackest of the three) very irregularly formed, generally passing very near or almost touching the discal spot; discal spot rather large, especially in the ♀, sometimes in this sex forming a small pale-centred ring. Hindwing with lines in distal part only (in pale specimens almost obsolete), running parallel with the distal margin, but somewhat lunulate-dentate. Under surface more weakly marked. Very variable, though perhaps less extraordinarily so than *autumnata*; the ♀♀ often more sharply marked than the ♂♂. The type form is somewhat greyish with the markings moderately well expressed. I have earlier (Ent. Rec. vol. 11, p. 121) suggested a more minute subdivision, but do not consider it necessary to reproduce it here. — ab. **obscurata** Stgr. has the ground-colour infuscated but with the parts which are normally whitest remaining somewhat paler and the bands still discernible in darker fuscous. It occurs in many (perhaps all) localities with the type and is the commonest form in many parts of England. — ab. **melana** Prout is an extreme development which I have only seen from the neighbourhood of London and the manufacturing towns of the Midlands and the North of England. Forewing unicolorous glossy blackish, hindwing also more or less infuscated. I believe it has been recorded from some German localities under the erroneous name of ab. *schneideri*. — ab. **fimbriata** Haw. is a curious and uncommon form in which the markings of the median area are almost or altogether obliterated while those of the terminal area remain darkened, suggesting a dark border. I possess one English example. — ab. **pallida** Prout is the whitest form, usually with the lines well expressed. It is often confused with *christyi* and *autumnata* but may be distinguished by the characters given above, especially the course of the postmedian line and the larger discal spot. — ab. **tectata** Fuchs (= *unicolorata* Lambill.). This name may be employed to denote all the non-melanotic forms in which the transverse lines are entirely or almost entirely effaced. FUCHS described it as "lighter or darker grey-brown, sometimes with yellowish tinge, uniform, without markings" and would possibly have included ab. *melana* with it. He bred it from *Acer monspessulanum* in the Rheingau, but also took it in oak-woods. LAMBILLION, in Belgium, obtained a rather lighter form ("uniform whitish grey"). — ab. **coarctata** Prout has the median area of the forewing much narrowed, the groups of lines which bound it being closely approximated. — ab. **latifasciata** Prout (= *bicinctata* Fuchs) is a handsome form with the basal and median areas of the forewing filled up with fuscous, the ground-colour remaining pale, with the normal transverse lines. — ab. **precursaria** Greys. is an unimportant aberration, rather small and narrow-winged, dirty brownish, the outer line of the hindwing (on account of its narrower shape) running more as in *autumnata* than in typical *dilutata*. — Egg glossy, with shallow pitting. Larva stout, rather bright velvety green, very commonly with a red or purple dorsal pattern which varies much in extent. It feeds on oak, elm, hawthorn and many other trees and is usually full-fed about the end of May. The moth appears in October and November, or earlier in northern localities. It is plentiful in Central Europe, but I have very little authentic information as to its wider distribution. The material which I have received or examined from more northerly and easterly localities (Scandinavia, Russia, Uliassutai) has nearly always proved to belong to *autumnata*. I have, however, one typical ♀ *dilutata* labelled North Finland (correctly?).

O. christyi Prout (9 f) agrees almost entirely in structure with *dilutata* and was at first regarded as a form of it, but Mr. ALLEN, who has given years of careful study to the subject, has shown it to be a distinct species. The genitalia nearly agree but the 8th abdominal segment in the ♂ shows a constant distinction; at the posterior extremity of the ventral side of this segment there are in both species two points or small projections but the distance between these is much wider in *dilutata* than in *christyi*, irrespective of the size of the specimens. The reader is referred for full details to "The Entomologist's Record", vol. 23, p. 79—82. ♂ antenna nearly as in *dilutata*, the projections perhaps slightly less strong. Wings rather more glossy than in *dilutata*, but less strongly than in *autumnata*, yellowish white or very pale greyish, the transverse lines generally weak (at least in the ♂), the antemedian in the ♀ sometimes more strongly expressed than the postmedian, both distinctly darkened costally and marked with black on the median vein and at the origin of the 3rd radial and 1st median branches; subbasal line in ♂ not angulated; postmedian lines formed nearly as in *autumnata* but with the

angle generally not quite so sharp; discal dot in both sexes minute, sometimes almost obsolete. Hindwing even more weakly marked than in *dilutata*. Much less variable than the other species; even the sexual dimorphism is in some localities almost inappreciable, though more strongly marked ♀♀ are also known. — ab. *oblita*. *oblita* Allen has the ground-colour somewhat more smoky, though less brownish smoky than in *dilutata*, while nothing so extreme as *dilutata* ab. *obscurata* and ab. *melana* is yet known. This is the only form of the species as yet found round London. — ab. *latifasciata* ab. *nov.* is a striking form, precisely parallel to the *dilutata* aberration of the same name, the basal and median areas of the forewing being entirely fuscous. The whiter, more weakly lined ground-colour renders it still more beautiful than the corresponding form of *dilutata*. ALLEN mentions it from Enniskillen and I have seen a long series which were collected with the type form and some intermediates in N. Argyleshire. — The egg is closely similar to that of *dilutata* but apparently even more highly polished. The larvae are not yet conclusively differentiated, but the red or purple dorsal markings of *dilutata* are in *christyi* often smoky blackish. It shows a preference for beech and elm, but has also been found on birch, alder and willow. It has not yet been taken wild on oak or hawthorn, which in some localities are the favourite food-plants of *dilutata*. The moth appears at about the same time as *dilutata* and is local in woods in the British Islands, Central and N. Germany and Austria. Probably when it is better known it will prove to have a considerably wider range. Hybrids of *dilutata* × *christyi* and *christyi* × *dilutata* are not difficult to obtain in captivity, but are not known to occur in a state of nature.

autumnata. **O. autumnata** Bkh. (= *nebulata* Thnb. nec Scop., *autumnaria* Weaver, *addendaria* B. White, *pallidescens* Ckll., *pallida* Clark) (9f). Antenna in ♂ slender, the joints not swollen anteriorly. ♂ genitalia with no hook on the harpes. Wings strongly glossy, silvery white, silvery grey or in the darker forms purplish fuscous, never with yellow or distinctly brown tone. Forewing with subbasal line distinctly marked, sharply angled in the cell; antemedian line often followed by a strong fuscous bar, the median vein here almost invariably blackened; postmedian line bent at a right angle between the 1st and 2nd radials, then much straighter than in *dilutata*. Hindwing in general appearing slightly longer than in *dilutata*, the distal margin being more extremely convex; white, except in the darkest specimens; weakly marked, the lines less curved than the distal margin. Extraordinarily variable. The name-type has the ground-colour silver white and the lines pale brown. — ab. *sandbergi*. *sandbergi* Lampa (= *virgata* Clark) differs in having the pale brown lines replaced by fuscous bars, the ground-colour remaining pale. Described from Sweden but occurs in various localities. According to DERJUGIN it was very abundant in N. Lapland in 1908. — In ab. *approximaria* Weaver (= *typica* Clark) the ground-colour is darker (violet-grey), the markings moderately well expressed. It is generally as common as the type. The original specimens were of a rather small race, transitional towards *filigrammaria* and were believed to have fed on pine. My Swiss series bred from larch belong almost entirely to this form. — ab. *schneideri*. *schneideri* Lampa (= *melana* Clark = ? *obscura* Petersen) is still darker, the forewing almost unicolorous, the hindwing also darkened towards the distal margin. In extreme cases where the postmedian line is no longer traceable it can still be distinguished from *dilutata* ab. *melana* by its more purplish tone. — ab. *intermedia*. *intermedia* Clark refers to the variegated forms in which the middle of the central area remains whitish, as also the subterminal line and narrow, dark-intersected bands on each side of the median area; hindwing whitish to beyond the middle, then fuscous. In my experience these forms have only occurred among the subspecies *filigrammaria*, in which they are very prevalent; but CLARK's were bred from the egg among a brood of *autumnata*. — ab. *unicinctata*. *unicinctata* Strand, described as a form of *dilutata*, is almost certainly an extreme development from the ab. *intermedia* of the present species, which is the *dilutata* of the Scandinavian authors. Very dark with a very distinct white-grey median band. Two examples were taken in a birch-wood together with many other forms of *autumnata*. If STRAND has ignored the other whitish markings it may prove synonymous with the preceding. — *guenéeata*. *guenéeata* Prout (= *autumnata* Guen.) is a local race peculiar to Central France. The ground-colour is dirty white as in the type form, but the lines are in part obliterated, being only well expressed costally; the black marks on the veins are on the contrary intensified. It varies very little. I have seen examples from the SAND collection. — *tunkunata*. *tunkunata* B.-Haas; from the Sajon district, Siberia, described as a variety of *dilutata*, will no doubt prove to belong here, as the wings are said to be glossy, blue-grey (blackish mixed) and with the subdorsal (? median) vein mostly strongly blackened in the middle of the wing. The median area of the forewing is in general very weakly marked, but usually dark-marked costally. Hindwing white-grey, with regular, sharply marked antemarginal line. The peculiar blue-grey colouring is liable to fade in old specimens. — *filigrammaria*. *filigrammaria* H.-Sch. (= *polata* Westw. nec Hbn.) is a small moorland form, or possibly distinct species, with a narrower-winged ♀, its distal margin being usually more oblique and the hinder angle more rounded off. It varies greatly but is on an average darker than *autumnata*, the dark markings being usually increased and intensified although the pale parts usually remain whitish. The white hindwing is nearly always more strongly marked than in *autumnata*, bearing a pair of distinct curved lines near the distal margin and generally more or less dark shading between these and the margin. In the type form the entire median area is dark, forming a solid central band. It is not rare. The commonest form, however, corresponds (except in its smaller size) to *autumnata* ab. *intermedia*. *filigrammaria* is locally common on the moors of

N. England, Scotland and Ireland and similar forms occur in Finland. — Egg slightly larger and much less glossy than that of *dilutata* and with the pitting considerably deeper. The larva, when full grown, is generally extremely similar to the plain green form of *dilutata*, though perhaps somewhat less glossy; but occasionally — as in the var. *filigrammaria* and some larch-feeding *autumnata* — it preserves the more striped appearance of the younger larvae. In any case the red- or purple-blotched forms do not occur in this species. When first hatched it is rather larger than that of *dilutata*. In the 2nd, 3rd and 4th skins it is very different, being less stout and having distinct yellow subdorsal line and lateral stripe. That of the form *filigrammaria* is on an average of a deeper green than that of the type, but the two forms differ little until after the last moult. It feeds chiefly on heather, while that of the type form affects various trees, especially birch, alder and Coniferae. *filigrammaria* appears in August and September, *autumnata* in September–November. It is said to be more sluggish by day than *dilutata*. Distributed in Northern and Central Europe and Russia and extending also to Siberia and N. America. Sometimes excessively abundant in Scandinavia, defoliating entire tracts of forest.

45. Genus: **Triphosa** Steph.

Face somewhat prominent and roughened, often with projecting cone of scales. Palpus longish, rough-scaled. Antenna in both sexes simple. Hindtibia with all spurs. Wings with distal margin crenulate, the hindwing deeply so. Forewing with areole double. Hindwing with discocellulars strongly biangulate.

Larva rather stout, compact, tapering slightly at the extremities; head small. On Rhamnus, etc., hiding when young between spun-up leaves; pupates in or on the ground. Pupa moderate or rather slender, the segmentation well marked; cremaster with forked spike at end; the fine hairs on sides of abdominal segments relatively rather longer than in most Larentiid pupae with which I can compare it.

Widely distributed in the Palearctic Region, India and America to Chili.

T. sabaudiata Dup. (5 h). A large species, differing from all the others in its very pale ground-colour. *sabaudiata*. The markings are weakly expressed, the subterminal line in the palest specimens entirely obsolete. Under surface still more weakly marked. Distributed in mountainous country from N. E. Spain to Bosnia and from Asia Minor to Issyk-Kul, occurring at varying elevations. — ab. **millierata** Brd. is a striking form with quite *millierata*. dark basal patch and median bands (bars bounding the central area). — **taochata** Led. (5 h) is a little darker than *taochata*. the type form and more strongly marked. It seems to be the only form known from Transcaucasia and about Digne but occurs together with the type in Asia Minor and according to recent records in Switzerland. — The young larvae are light green with white longitudinal lines; full-grown they are blackish with shiny black head, yellowish longitudinal lines and above the legs with elongate orange-yellow, whitish-margined spots, each containing a white dot. On Rhamnus carniolica (alpina) and young ash. ZAPATER and KORB give Inula helenoides as a foodplant. It feeds in June and July. Imago in August.

T. dubitata L. (5 i), the name-type and longest-known species of the genus, is not likely to be confused *dubitata*. with any other species; *Calocalpe cervicalis* has a narrower central band and considerably darker hindwing. In typical *dubitata* the forewing is rather strongly marked with numerous dark lines and beautiful vinous reflections overspread a great part of the wing, or at least the median area. — ab. **cinereata** Steph. (5 i) is *cinereata*. usually smaller, always more weakly marked and without the vinous reflections. It occurs in many (perhaps in all) localities with the type. — ab. **punctigera** Strand is an unimportant aberration in which the hindwing *punctigera*. is entirely unmarked except for a discal dot and sometimes slight traces of dark dots on the veins. — The larva is yellowish green with darker green longitudinal lines. I have found it only on Rhamnus catharticus and frangula, which are certainly the favourite foodplants, but it is said to feed also on species of Prunus. It is full-fed in June. Pupa dark red-brown with a slight purplish bloom, the leg- and tongue-case slightly projecting. The moth appears towards the end of July or in August, hibernates in houses, caves or other such retreats and pairs in the spring. It is widely distributed in Europe and is also recorded from Transcaucasia, China, S. E. Siberia and Japan. The Chinese and Japanese examples are probably best referred to the *cinereata* form, lacking the red tinge though stronger-marked than European *cinereata*.

T. sericata Btlr. (= subsericata Stgr.) (11 f as *sericaria*). Shape of *dubitata* and with similar gloss, but quite *sericata*. distinct in the much more broken markings. In the typical, Japanese form — which, however, also occurs in the Ussuri district — the ground-colour is light brownish, on the forewing with a reddish flush. — **oberthüri** *oberthüri*. Hedem., from Amur and Ussuri, is much darker, leaden grey, not reddish. PÜNGELER, however, has expressed a doubt whether the distinction is tenable, as the ♂♂ in this species are in general somewhat darker than the ♀♀. — **decolor** subsp. nov., from Kwei-Chow, W. China, also lacks the reddish suffusion, but is much *decolor*. paler than the name-type, whitish brown with the markings still more interrupted; antemedian band of forewing

entirely obsolete between median and submedian veins, only reappearing as two small posterior spots, one on the submedian, the other at the margin; subapical spot on the contrary somewhat extended and more mixed with fuscous. Type and three other examples in the British Museum collection, ex coll. LEECH.

rubrodotata. **T. rubrodotata** Walk. (61) differs from *dubitata* in its much larger size, rather less glossy wings and more variegated colouring. The pale bands are much paler than the corresponding parts in *dubitata*; the veins in the distal area are in part strongly dark-marked, whereas in *dubitata* the dark marking is less pronounced and reduced almost to mere dots; hindwing darker than in *dubitata*, the veins still darker, white-spotted; distal area suffused with red. Under surface darker than that of *dubitata*. N. India and Kwei-chow, W. China, June-July.

expansa. **T. expansa** Moore (5k) sunk by HAMPSON to the preceding, lacks the crimson basal and median bands. The median area is on an average somewhat narrower, the projections in its distal edge — particularly the bilobed projection between the 3rd radial and 2nd median — less strong, the succeeding area less pale; distal margin of hindwing not crimson. From *dubitata* its large size will at once distinguish it. N. W. Himalayas and Pu-tsu-Fong (W. China), June-July.

largeteau-aria. **T. largeteauaria** Ob. (61), wrongly described (apparently from the ♀ only) as a *Eucosmia* (= *Calocalpe*), is still nearer to *rubrodotata* in the shape and width of the median band, which, however, projects less at the 1st radial and is of a dull dark brown-grey colour, not crimson. The hindwing nearly always shows a pale area beyond the middle. Occurs in several localities in W. China, June-July.

amdoënsis. **T. amdoënsis** Alph. is unknown to me. STAUDINGER has sunk it to *Eucosmia alternata*, but ALPHERAKY maintains it is a true *Triphosa*, agreeing in structure with *sabaudiata* and *incertata*. Smaller than *sabaudiata taochata*, hindwing with less strongly crenulate distal margin, marginal line almost continuous, black, distally dotted with white between the veins, the hindwing paler, more indistinctly marked, almost whitish. Subterminal white line of forewing rather sharply expressed. — ab. **fasciata** ab. nov. is analogous to *incertata* ab. *fasciata*, the median band being darkened, while anteriorly and posteriorly there is a strong brownish or reddish tone; in the present species the brownish colour does not extend beyond the subterminal line. Myn-dyn-scha, Amdo.

albiplaga. **T. albiplaga** Ob. (5k, 71). Very distinct in markings from the more typical species of the genus, rather recalling, in the oblique white markings of the forewing, the *amplicata*-group of *Photoscotosia*, but readily distinguished by the crenulate margin of the hindwing, absence of white patches in the hindwing, absence of hair-tuft beneath the ♂ forewing. Wings slightly narrower than in typical *Triphosa*, marginal crenulations less deep. Distributed in W. China, May-August. Local races also occur in India.

incertata. **T. incertata** Stgr. (8d). Smaller than *dubitata*, distal margin of forewing less curved, of both wings less strongly crenulate. Frontal tuft strongly developed. Wings less glossy, coloured nearly as *Calocalpe undulata* or rather darker, but without the strong pattern of dentate dark lines, the markings more nearly resembling those of a weakly-marked *C. cervicalis*. Forewing with the dentate pale subterminal line not terminating posteriorly in such a conspicuous spot as in *cervinalis* and *dubitata*. Hindwing scarcely paler than forewing, in the distal one-third concolorous with forewing, the pale subterminal therefore distinctly marked. Under surface more glossy and weakly marked, postmedian and subterminal lines indicated, cell-spots more apparent than above. — ab. **fasciata** Stgr. has the base of the forewing and a broad median fascia dark grey. — Ferghana to the Tarbagatai Mountains.

dubiosata. **T. dubiosata** Walk. (11g) differs from *incertata* in its rather darker and duller (more greyish brown) colour, somewhat more oblique distal margin of forewing (at least in the ♂), rather broader median band, usually conspicuous dark discal dot on forewing above, more interrupted subterminal line of both wings (yet developing rather conspicuous white spots behind the 3rd radial and 2nd median of forewing) and more curved or subangled postmedian line on hindwing beneath. Hindwing above often very weakly marked. — ab. **variegata** (Warr. M. S.) ab. nov. has the areas proximally and distally to the median band of the forewing suffused with reddish ochreous. — *dubiosata* is widely distributed in Afghanistan and India and according to WILEMAN occurs also in Japan.

s eseraria. **T. seseraria** Ob. (13a) is only known to me from OBERTHÜR's figure, here copied. Information by which it could be definitely located (such as sex and structure) is not given, but as the figure seems to show a ♂, and has neither the anal tufts nor the hair-tuft of the hindwing, I place it here. Otherwise I should have

thought it might represent an extreme development of *Calocalpe tristis* ab. *bicolor*, with nearly the entire forewing washed over with sandy light-brown. Ta-chien-lu.

T. multilinearia *Leech* (? = *tremulata* *Guen.*) is rather larger and much darker and more glossy than *dubiosata*, strongly recalling in its colour, and in the formation of the subterminal line, *Philereme vashti* (11e) but without the enlarged ♂ anal clasps of *Philereme* and with the distal margin of the forewing rather more oblique in the ♂ than in the ♀, as in *dubiosata*. It cannot be confused with any other *Triphosa*. On the forewing the alternate darker and lighter lines are almost as numerous and almost as dentate as in *Calocalpe undulata*, though less striking on account of the darker colouring; the paler ones, however, are a good deal dusted with whitish in places and those which bound the median area usually show more white on them, the postmedian in particular bearing conspicuous white dots on the veins. Hindwing and under surface more weakly marked. W. China: Ta-chien-lu and Che-tou, May to August. A ♀ from the MOORE collection, from N. India also belongs here; MOORE has labelled it "*Scotosia tremulata* *Guen.* same as type."

T. ravulata *Stgr.* is possibly a variety of *incertata* or *dubiosata*, distinguished by its light grey colouring. Forewing with slight suggestion of green tinge in the ground-colour, with the usual waved darker lines and bands, but rather weakly expressed, and dentate whitish subterminal; the bands which bound the central area possibly less strongly bent costally than in *incertata*; a weak dark discal dot present (wanting in *incertata*); marginal line or dots less developed than in *incertata*. Hindwing feebly marked. Underside whitish grey. Issyk-Kul.

T. confusaria *Leech*. Wings shaped nearly as in *albiplaga* but slightly narrower still. Forewing dirty white, dusted and clouded with greyish fuscous; basal patch fuscous; a narrow intermediate band fuscous; antemedian band dentate-edged, but not sharply defined, touching a black discal mark; postmedian band darkest at costa and on the veins, otherwise ill defined, its distal margin deeply indented, the indentations marked with white dots on the veins; distal area dark-clouded, subterminal line interrupted, except anteriorly. Hindwing whitish, darkened distally and with black terminal line; inner margin posteriorly with beginnings of dark lines. Pu-tsu-fong, 3000 m, June and July.

T. sideritaria *Ob.* (13b), from Ta-chien-lu, is scarcely described, the structure not at all, and seems to have been misidentified hitherto. According to the figure it is lighter than *confusaria*, more uniformly greyish, the bands weak, postmedian less deeply dentate and more regular, followed by a more complete whitish line, distal area little darkened, subterminal line quite ill-defined. Possibly a *Calocalpe* near *fasciaria* *Leech*.

T. moniliferaria *Ob.* (6k, as *monilifera*). Shape approximately as in the two preceding, pattern very distinct. Forewing white, suffused with fleshy-brownish; basal patch and a half-band arising from middle of costa dark brown. Generally not variable. — ab. **depleta** *Warr.*, however, differs strikingly in having the central band further reduced to a simple black oblique mark from the costa just before the middle, confluent with the dark cell-spot. — The species is distributed in W. China in June and July.

46. Genus: **Calocalpe** *Hbn.*

Distinguished from the preceding genus by the presence on the ♂ hindwing of a strong tuft of hairs — no doubt scent-hairs — which is inserted in a furrow on the under surface near the inner margin. I can find no other constant differences and am inclined to agree with GUENÉE and HAMPSON that this character is only subgeneric. The areole is normally double, but in *latifasciaria* sometimes single.

Early stages similar to those of *Triphosa*, the short, stout larva living in a domicile of spun-together leaves. Distribution as of *Triphosa*.

C. cervinalis *Scop.* (= *cervinata* *Hbn.*, *certata* *Hbn.*) (5i). The name-type is light brown tinged with fawn-colour or with a somewhat more ochreous shade. Hindwing scarcely paler than forewing. Very variable in colouring and even in the width of the band. — ab. **griseata** *Bastelb.* differs in the light blue-grey tone of the wings, both above and beneath. Markings as sharp as in the type form. Founded on 2 ♂♂ from Sprottau. — ab. **rubescens** *Rbl.* has the forewing of a more uniform rust-colour, without the dark lines, but with a distinct dark median band. Not infrequently in this form the basal patch and median band are uniformly darkened, forming a striking contrast to the ground-colour. — ab. **infuscata** *Rbl.* has the forewing almost uniform dark brown, the hindwing also darkened. The markings in consequence not prominent. — **simplonica** *Wackerz.* (5i)

is a smaller, weakly marked light grey race from Valais. It occurs as an aberration in other places. — Larva grey or blue-grey, paler ventrally, the dark dorsal line white-edged on each side, subdorsal line fine, white, the sides with yellow or orange blotches; head red-brown. On Berberis in June—July. Pupa short and thick, red-brown, cremaster more blackish, short, ending in a short fork. It hibernates in a tough oval cocoon and the moth appears the following May. Central Europe, Transcaucasia to Transcaspia and again in the Ussuri district and Japan.

veternata.

C. *veternata* Chr., on which GUMPPENBERG has founded his genus *Eutriphosa*, is smaller than *cervinalis*, with the distal margin of both wings straighter; according to STAUDINGER, however, CHRISTOPH and GUMPPENBERG have laid too much weight on the distinctions in the shape, which varies somewhat. Colour much paler. Forewing light reddish grey, in the ♀ almost whitish, markings similar to those of *cervinalis*, but the proximal edge of the median area is more bent, and shows two slight, blunt projections, the distal edge, on the other hand, after the first subcostal bend comparatively straight; an oblique dark streak from apex. Only known from the Ussuri district.

excultata.

C. *excultata* Chr. (= *varia Hedem.*, *hedemannaria Ob.*) (8d, misprinted *exultata*) is also very similar to *cervinalis*, but readily distinguished by its more gay colouring (the ground-colour having a decided rosy tone) and by the shape of the median band. Ussuri and Japan.

*monti-
vagata*.

C. *montivagata* Dup. (5k). Greyer and more weakly marked than *cervinalis*, but also differing somewhat in shape, the distal margins being less strongly crenulate. Central area generally broader, terminal line less sharply black. The ♂ hindtibia, as well as the hindwing, is furnished with dense tufts of blackish hair. A very local species; apparently in Europe confined to high altitudes in the Alps, the Sierra Nevada and Sierra de Albarracin, but occurring again in Asia Minor, Transcaucasia and N. Persia, chiefly in forms transitional towards the form *hyrcana*. — ***andalusica* Ribbe.** The Sierra Nevada race has been separated under the above name on account of the sharper markings of the forewing, with larger, darker discal mark and the presence of more distinct lines in the proximal half of the hindwing. — ***hyrcana* Stgr.** is larger than the type form, the forewing more variegated, the median area being more distinctly banded, the distal area with better-marked lines. — Larva reddish grey with fine black dorsal line and dark lateral lines, in August and September on Berberis vulgaris. The pupa hibernates and the moth appears in June and July.

andalusica.

hyrcana.

alternata.

C. *alternata* Stgr. (5i) belongs to a difficult group of obscure greyish species, but may generally be separated by the pale, in part whitish hindwing. The somewhat yellowish grey of the forewing (in this and some other figures on plate 5 an incorrect pinkish tone is suggested) somewhat recalls — as the author has remarked — that of *Entephria caesiata*. The discal dot may be present or absent. Both wings with black terminal line, interrupted by whitish dots. Fringe dark spotted. — In ab. ***fasciata* Stgr.** the basal and median areas are strikingly darkened, the spaces on each side of the median area light ochreous brown. — Koko-nor. Perhaps also Amdo, compare the remark on "*Triphosa*" *amdoënsis* above. — ***nudaria* Leech** (11f) is rather larger and more strongly marked, both above and beneath, than the *alternata* which I can compare, but otherwise entirely agrees. Perhaps not even a local race. Ta-chien-lu, May-June, 1 ♀.

fasciata.

nudaria.

fasciaria.

C. *fasciaria* Leech (11e) also has the ground-colour pale grey with a slight tinge of yellowish, but the hindwing is not paler than the forewing. Slightly narrower-winged than *alternata*, the lines obsolescent except in the median area, where they are better expressed; an oblique, much interrupted dark mark below the apex; *no terminal line*; fringe weakly dark-spotted. Both wings beneath more grey as far as the postmedian, paler and more yellowish beyond, discal dots well expressed. Che-tou, 3430 m; July or August.

grisearia.

C. *grisearia* Leech, which may possibly be a lighter-coloured race of the Indian species called by HAMPSON *tremulata* Guen, is on an average larger than *alternata*, with the markings more strongly expressed, their colour much more brownish; the distal edge of the median area forms a stronger double projection on each side of the 1st radial, the anterior one the longer; the median area is followed — at least in its anterior half — by a whiter band; the white subterminal is more deeply dentate in its anterior half. Hindwing more mixed with brownish than in *alternata*, though rather variable; subterminal line rather deeply dentate. Under surface more whitish than upper, the discal mark of the forewing large; that of the hindwing also distinct, but smaller; postmedian line present, the forewing in addition (more rarely also the hindwing) with some dark clouding proximally; apical area of forewing more or less darkened from costa to 3rd radial. W. China; Che-tou, Omei-shan and Ta-chien-lu, May—August. One Che-tou ♂ shows the bright brown shades of *alternata* ab. *fasciata*, but the median area is not consolidated into a band.

C. tristis *nom. nov.* (= *sideritaria* *Leech* nec *Ob.*) (12b). Rather smaller than the preceding and much darker. *tristis*, recalling the darkest species of *Triphosa*; intermediate in colour between *T. dubiosata* (11g) and *multilinearia*. Forewing rather narrower than in *alternata* (5i), the markings rather similar, distal edge of median area and anterior part of subterminal line less dentate than in *grisearia*; the subterminal is fine, sometimes a little interrupted, and is of a bluish or greyish white, becoming purer white behind the 2nd median vein, where it develops a conspicuous triangular spot. Hindwing almost uniformly dark, with a fine bluish-white, scarcely dentate subterminal line. Underside rather uniformly dark, both wings with discal mark (that of forewing not quite so large as in *grisearia*); and with a postmedian line, that of the forewing less bent than in *grisearia*, that of the hindwing placed rather nearer to the discal spot; forewing with whitish subterminal usually indicated, but chiefly as dots on the veins and larger mark behind 2nd radial. — ab. **bicolor** *ab. nov.* has the areas between the basal patch and median band and between the latter and the subterminal line bright brown. One ♂ from Ta-chien-lu. — W.-China: Omei-shan (type ♂ and others, July), Wa-shan (July) and Ta-chien-lu (May—July), all from the LEECH collection.

C. undulata *L.* (8d) may always, except in one extreme and rare aberration, be known by the regular *undulata*, undulate lines which, in almost equal strength, traverse nearly the whole forewing and much of the hindwing; those of the median area are sometimes a little thicker, especially at the costal margin of the forewing; hindwing proximally to the discal dot without lines. Underside similarly but less regularly marked with larger discal dots, more sharply expressed postmedian line etc. — In ab. **subfasciata** *Reuter* the median area, at least *subfasciata*, of the forewing, is darkened into a band while the other lines are weaker than normal, in extreme cases even obsolete. — Larva dorsally purple-brown with 4 fine yellowish lines or pale bluish grey with the lines white; lateral stripe grey or sometimes blackish; ventral area paler, variable in tone. On saw, aspen and *Vaccinium*, hiding between spun-together leaves. Full-grown in September—October. Pupa stout, shiny, the sculpturing and pitting faint, cremaster ending in a bifurcated spike bright red-brown, cremaster blackish. The moth appears in the following June and inhabits Central and Northern Europe, a great part of Asiatic Russia and also North-America.

C. marmoraria *Leech* (71) cannot possibly be confounded with any of the foregoing. The wings are *marmoraria*, more strongly glossy, the ground colour purer white, largely obscured by rich black-brown marbling, which is for the most part sharply defined. Underside similar. Distributed in W. and Central China, June—August. The abdomen is orange with black spots, showing a transition to the last few species of the genus, which are almost certainly mimetic of *Abraxas*.

C. inanata *Chr.* (= *costipunctaria* *Leech*) (7e) is equally unmistakable. Smaller and more slenderly *inanata*, built, distal margin of hindwing less strongly crenulate. Forewing dirty yellowish white, the dark lines exceedingly faint and fine, except at costa, where they form dark fuscous blotches. Hindwing with a faint postmedian line, which is more conspicuous beneath. Amurland and widely distributed in W. China and Tibet. Abdomen concolorous with forewing, but with dark dorsal spots.

C. flavipes *Ménétr.* (= *flavipedaria* *Ménétr.*) White with a macular black pattern recalling that of an *flavipes*, *Abraxas*. Forewing at extreme base yellow, bordered by a black line or band; antemedian, median and postmedian costal spots, the two latter more elongate than the former, the median strongly oblique; one or two spots in the disc; a subterminal series of three spots, the first costal, the second between the radials, the third from 1st median to hindmargin; distal margin with a series of partly confluent black spots, somewhat elongate so as almost to meet the subterminal series. Hindwing with some black spots near base and in inner-marginal half of the wing, a long subterminal one from the margin to the 1st median corresponding to that on the forewing; terminal series smaller and more isolated than on forewing. Underside the same. Abdomen yellow with large black spots. Amurland. MÉNÉTRIÉS was deceived by the mimicry into describing it as an *Abraxas*. — **interruptaria** *Leech* (11g), from W. China, has the spots larger, in particular the antemedian and *interruptaria*, median costal spots of the forewing; the forewing has also a complete postmedian series of black wedge-marks on the veins and the subterminal and terminal rows are only separated by a fine white line. Hindwing with the terminal spots considerably enlarged.

C. latifasciaria *Leech* (11g) is related to the preceding but larger, broader-winged, the markings deeper *latifasciaria*, black and still much more extended than in the form *interruptaria*. Japan: Oiwake. A strange anomaly of neuration has led WARREN to erect an untenable genus (*Xenospora*) for this species; the vein which divides the areole is sometimes (2 out of 7 specimens examined) obsolete.

47. Genus **Photoscotosia** Warr.

Face somewhat prominent and roughened. Palpus moderate, rough-scaled. Antenna in ♂ shortly ciliated. Hindtibia with all spurs. Wings ample, hindwing with distal margin not or scarcely crenulate, costal margin strongly rounded, especially in the ♂; retinaculum very strong. Forewing with areole double; ♂ with a strong pencil of long spreading hairs arising near the base behind the median vein and covering most of the submedian fold. Hindwing with cell short, its anterior margin very short, the 3rd discocellular being extremely oblique; costal anastomosing with anterior margin of cell to a little beyond its middle, then sharply diverging; 2nd radial arising somewhat before the middle of the discocellulars.

Early stages unknown.

A very natural genus, distinguished from the *Calocalpe-Philereme* group by the shape of the hindwing, its discocellulars and the hair-pencil on the ♂ forewing. The species are among the largest of the Larentiids and many of them are very handsome. Although a fair number of species are known, the geographical range is somewhat restricted. Most inhabit the mountains of Turkestan, N. India and Tibet, but stragglers reach eastward as far as Japan and southward to Java. *Trichopleura* Stgr. (nom. praeocc.) and *Lasiogma* Meyr. are synonyms.

atrostrigata. **Ph. atrostrigata** Brem. (= *lucicolens* Btlr.) (5h) is the only species known from Eastern Asia and is easy to recognize, although the median area is rather variable, commonly much lighter than in our figure. Hindwing entirely dark or (in the ♂) with the costal part white; distal margin darkest, subterminal line present, but often incomplete. Under surface strikingly different, both wings yellow-whitish; forewing with smoky suffusion from base to near the middle (at least in the ♀), a black postmedian costal blotch and a dark smoky apical cloud, leaving the extreme apex white; hindwing with a (generally indistinct) curved postmedian line. Japan, S. E. Siberia and Central China. A local race on Formosa.

miniosata. **Ph. miniosata** Walk. (6k). Forewing similar to that of the preceding, but rather more reddish, especially in the ♂. Hindwing with large oval or sometimes irregularly shaped distal blotch of bright orange, reaching inwards almost to the cell and posteriorly about to the 1st median; costal margin in ♂ broadly white. Underside with the orange colour paler but appearing also on the forewing, the markings of the forewing nearly as in *atrostrigata*. N. India to W. China and on Formosa.

propugnataria. **Ph. propugnataria** Leech (11g), of which only a single specimen is known, differs from *atrostrigata* in the shape of the markings of the forewing and in the presence of a small orange blotch in the hindwing (much more restricted than that of *miniosata*). Under surface with the smoky suffusions stronger and more extended than in *atrostrigata*, the line on the hindwing strong, sharply bent between the 3rd radial and the 1st median. Wa-shan at nearly 2000 m elevation, taken in June.

apicinotaria. **Ph. apicinotaria** Leech (5k). Forewing in the ♂ coloured nearly as in *miniosata*, or sometimes more variegated with olive-greenish, thus rather approaching *atrostrigata*. From both it may be distinguished at a glance by the pale apical patch. Hindwing in the ♂ similar to that of ♂ *atrostrigata*, slightly darker, the white costal area somewhat more restricted. ♀ rather larger, forewing nearly as in the most variegated ♂♂, rather richly coloured; hindwing with an orange patch near apex, reaching from costal margin to 3rd radial and basewards to just inside the postmedian line. ♂ beneath with darker hindwing than *propugnataria*, the line less strongly bent; ♀ more as in *miniosata*, the orange rather more restricted. W. China, June—August.

fasciaria. **Ph. fasciaria** Leech (11f) is very distinct from all the other species in the broad median area, which is entirely filled-in with uniform velvety blackish brown. On the hindwing the orange colour is more extended than in *miniosata* and shows, in well-marked specimens, a deeply dentate fuscous postmedian line. Forewing beneath yellowish, hindwing more orange, both strongly dusted, except in the region of the postmedian line, with fuscous; postmedian line of forewing shaped as above, of hindwing angled between 3rd radial and 1st median. How-kow, Tibet, July—August.

funebria. **Ph. funebris** Warr. (11f) is equally unmistakable on account of its nearly uniform blackish forewing; the transverse lines and discal mark are deep black, all the lines more or less dentate. The hindwing also is darker than that of *miniosata*, which it most nearly resembles in the shape and extent of the orange blotch. Under surface smoke-colour, the orange blotch of the hindwing reproduced; ♂ in addition with a yellowish blotch distally to the cell of the forewing and nearly reaching the hindmargin. W. China, June—August.

palae-arctica. **Ph. palae-arctica** Stgr. (5h) is, at least in its typical form, the palest and most weakly-marked species of the genus. The lines are mostly incomplete, but the antemedian is stronger and usually complete and

crosses the cell-spot instead of being placed proximally to it as in all the other species; its course is also characteristic, as will be seen from our figure; postmedian distinct at costa only. Hindwing white, the distal margin only faintly darkened. Underside dirty white, forewing with thick costal mark indicating commencement of postmedian. Ferghana to Thian-Shan and Tarbagatai Mountains. — *fusca* *Stgr.* has the forewing much darker and more distinctly marked, the hindwing with a fuscous distal border. Kashgar. *fusca*.

Ph. leechi *Alph.* (5 h). Related to *palaeartica*, the forewing very similar to the form *fusca*. The antemedian line *precedes* the cell-spot and is more normally formed, the postmedian projects less far at the 1st radial but on the other hand forms a sharper projection behind the 3rd radial, and is accompanied distally by a slender white line; apex with a distinct black streak. Hindwing cleaner white, the dark border less extended than in *palaeartica fusca*. Underside also whiter, especially the hindwing. Amdo and Koko-Nor. *leechi*.

Ph. undulosa *Alph.* (5 h). This and the 3 following constitute a rather difficult group, on account of the great similarity of the markings on the one hand and their evident variability on the other. The present species and *achrolopha* differ from those which follow in their paler fawn-coloured forewing, generally paler hindwing and underside and absence of greenish subbasal and postmedian bands or shades. In *undulosa* the antemedian black line of the forewing is not sharply defined proximally, the postmedian forms a series of very deep curves and long teeth. Hindwing in the ♂ white with dark distal border, in the ♀ more suffused with grey. Underside dirty whitish, forewing shaded with fawn-colour and smoke-grey; both wings with discal dot and postmedian line, at least in its anterior half, thickened at costa margin. S. W. China and Koko-Nor. *undulosa*

Ph. achrolopha *Püng.* (5 h; 5 k, as oberthüri) is aberrant in that the ♂, instead of the black hair-tuft on the forewing beneath, has only a slender, colourless pencil between the submedian veins. It differs further from *undulosa* in having the antemedian line sharply defined proximally, preceded by a dark line, the postmedian broadened, less deeply lunulate-dentate, but with a sinus inwards between the radials. Ground-colour both above and beneath somewhat paler. Koko-Nor. *achrolopha*.

Ph. rectilinearis *Leech* (11 g). More deeply coloured than *undulosa*, the proximal area (except a narrow pale green band) being bright brown, the distal area and a costal spot proximally to the postmedian strongly tinged with the same; the black antemedian line straight; an interrupted greenish shade follows the postmedian. Hindwing dark grey becoming brown distally; anterior part of fringe pale yellow. Under surface pale yellowish strongly irrorated with fawn-colour; basal area of forewing suffused with dark smoky especially at the antemedian line, distal area darker fawn-colour, leaving a pale apical spot; both wing with cell-mark and beginnings of postmedian line. Omei-shan, 1 ♀, taken in July. Possibly an aberration or variety of the Indian *multilinea*. *rectilinearis*.

Ph. pallifasciaria *Leech* (5 k) is still further removed from *undulosa* in colouring, the pale fawn-colour being almost entirely replaced by bright browns. Forewing with subbasal band less dark than in that species dissolved into lines, the succeeding area more marked with lines, median area white or yellow-white, narrower, than in *undulosa*, postmedian forming a shallow sinus inwards between the radials, then shallowly lunulate and dentate; apex rather pale. Hindwing more white-mixed than in *rectilinearis*, otherwise similar. Underside also quite similar, the dusting slightly darker. Che-tou, 3500 m, July-August, founded on 2 ♀♀. Also occurs in Sikkim where (at Yatong) it is either extraordinarily variable or has hitherto been confused with one or two similar species. Like the preceding, it may possibly have to sink to *multilinea*. *pallifasciaria*.

Ph. velutina *Warr.* (8 c *vetulina* in the plate) is a very distinct species. The blend of yellowish-grey (in very fresh specimens more olivaceous), reddish brown and velvety black in the forewing rather recalls *atrostrigata* but the white hindwing and the character of the markings separate it widely from that species. The black markings are the most characteristic. Hindwing in both sexes clear white, broadly suffused with smoky at inner margin and with a dark (sometimes yellow-mixed) marginal band; a dentate postmedian line, angled behind 3rd radial, sometimes obsolescent in ♂; the ♀ often has the smoky suffusion more extended. W. China, July—August. *velutina*.

Ph. amplicata *Walk.* (= *trisignata* *Moore*) (6 l). This and the remaining species of the genus are less attractively coloured than the preceding, being chiefly brown-black and white. In typical *amplicata* the exact proportions of brown and black vary, as also the size of the white costal mark, which is often reduced and broken up into 2 or 3 small spots; an obscure, partly interrupted white line bounds the median area distally, but proximally such a line is scarcely ever noticeable. Hindwing dark smoky with the costal area narrowly (♀) or more broadly (♂) white. Forewing beneath with the disc largely whitish, not sharply bounded, a sinuous postmedian line, thick on costa, obsolescent posteriorly; a dark discal dot; a white spot at apex. Hindwing beneath white, mostly dusted with grey, a discal dot and a postmedian line present, the latter bent behind the 1st radial. Distributed in Sikkim and the N. W. Himalayas. — *dejeani* *Ob.* (6 l) is a form with the white *dejeani*.

markings purer and more extended, the costal blotch being large and broad, the antemedian usually well-developed and the apex more definitely white-marked. W. China; also as a rare aberration in the N. W. Himalayas. — *Ph. rivularia* *Leech*, from Omei-shan, is rather darker and more richly coloured than the type form, the white costal mark nearly as in that, the postmedian line conspicuous, broader than in the other forms, the apex scarcely whitish; hindwing whitish, with a dark marginal band of equal breadth (about 3 mm) and intensity throughout, fringes chequered. Underside sharply marked. Possibly a distinct species. — *postmutata* *subsp. nov.*, which may also be a distinct species, has the forewing coloured nearly as in the Indian type, but somewhat transitional towards *penguionaria*, the white costal patch reaching to the middle of the wing, but throughout obscured by grey dusting; the hindwing white (rather clearer than in *rivularia*) with a dark border nearly as in that form. How-kow, Tibet; also one example from Omei-shan. Rather larger than *rivularia*.

penguionaria. **Ph. penguionaria** *Ob.* (6 l) differs from *amplicata* in the complete loss of the white costal patch, almost the only white marking which remains being the dentate shade (sometimes reduced to a row of dots) distally to the postmedian; veins a good deal marked with bright ochreous. Hindwing rather more uniform than in *amplicata*, nowhere extremely dark; one or two wavy lines present. Under surface rather uniformly dusted, forewing without white apex; postmedian line of both wings rather less angled behind 3rd radial than in *amplicata*. Ta-chien-lu and How-kow, Tibet, reaching elevations of over 3000 m.

tonchignearia. **Ph. tonchignearia** *Ob.* (6 l, as bicolor; 9 h) is somewhat smaller than *amplicata*, with rather more curved but less oblique distal margin, the forewing therefore appearing rather shorter and more rounded. The subbasal line of the forewing runs more obliquely towards the hindmargin, the antemedian projects less strongly distad behind the median vein; the hindwing both above and beneath lacks the postmedian line, being clear white, with smoky suffusion at base and narrowly along inner margin and a more sharply defined blackish border than even in *rivularia*. The white costal blotch in the middle of the forewing is extremely variable in development. Forewing beneath with smoky proximal half and a broad blackish distal border, the latter preceded by a black mark on the costa and containing a sharply defined white apical spot. W. China, Tibet and Kulu. HAMPSON and LEECH have sunk this species to the Indian *Amnesicoma bicolor* *Moore*, to which it bears an extraordinary resemblance but which differs in the generic characters, *tonchignearia* being a typical *Photoscotosia*.

albomaculata. **Ph. albomaculata** *Leech* (11 g) is easily distinguished from *tonchignearia* by its much broader dark border, both above and beneath. The wings are slightly longer (approaching *amplicata*). Omei-shan, July, only one example known.

48. Genus: **Amnesicoma** *Warr.*

Habitus and general characters of *Photoscotosia* but the forewing without hair-pencil, the hindwing with anterior margin and costal vein less strongly curved.

Only 3 species are known, inhabiting India and Tibet. It forms a transition between *Photoscotosia* and *Cidaria* and might probably be united with either, according to the weight attached to particular characters.

nuncupata. **A. nuncupata** *Püng.* Very near *Photoscotosia leechi* in size and markings, the colour more red-brown, especially in the median area, the distal edge of which is not so distinctly dentate; underside less glossy, dusted with grey, darker, especially the hindwing, which shows a distinct cell-spot. Occurs together with *leechi* in the Koko-nor district, end of July.

49. Genus: **Philereme** *Hbn.*

This genus, often called by STEPHENS's later name of *Scotosia*, is doubtfully tenable, as it only differs from *Triphosa* in the ♂ genitalia, which show enormously developed anal claspers.

Larva and pupa similar to those of *Triphosa* and *Calocalpe*, the larvae sometimes feeding exposed, sometimes spun up in leaves.

Distributed in the Palearctic Region.

vetulata. **Ph. vetulata** *Schiff.* (= ? *undulataria* *Hufn.*, *affectata* *Ev.*) (8 a, b). Shiny grey-brown, both wings traversed by numerous slightly darker wavy lines, which are angulated subcostally on the forewing; both wings with blackish discal dot above and beneath. I have never seen really banded specimens; indeed *vetulata* generally varies very little. It inhabits Central and North Europe, parts of Siberia and Transcaucasia. —

vetustata Stgr., from the Ussuri district, has the distal margin of the hindwing less dentate and the discal dots of both wings almost wanting. — The larva hatches in the spring and feeds up rapidly in May-early June; it is stout and rough-skinned, the segments strongly marked, the colour mostly black at first, latter blue-grey with fine whitish dorsal lines and yellow lateral stripe, the head black. On *Rhamnus catharticus*, in spun-up leaves. Pupa rather slender and smooth, shining light reddish; in a slight cocoon on the ground or in the old larval habitation. Imago in the latter part of June and in July. *vetustata*.

Ph. corrugata Btlr. (8b) is closely related to *vetulata* and has the ♂ abdomen similarly built. Rather smaller and narrower-winged, ground-colour very much paler (light straw-colour, the ♂ more whitish than the ♀), the principal lines somewhat dark-marked costally, rather straighter after the subcostal angulation, the enclosed median area rather narrow. Discal dots obsolete. As in *vetulata vetustata*, the distal margin of the hindwing is not deeply dentate. Japan: Yesso, Hakodate, etc. *corrugata*.

Ph. bipunctularia Leech (11i). Whitish brown with the dark wavy lines distinct; but chiefly distinguished by the presence on the forewing of two conspicuous quadrate costal spots marking the boundaries of the median area; the antemedian and postmedian lines sometimes rather more conspicuous than the rest. Under surface more weakly marked, the antemedian costal spot wanting. Central and Western China, July and August. *bipunctularia*.

Ph. neglectata Stgr., described from one ♀ only, is said to be near *vetulata* but with the forewing more acute, the hindwing much more weakly dentate. Ground-colour dirty grey without any admixture of brown; apical part of the distal margin of the forewing broadly blackish-grey, median area with its distal edge more strongly waved, somewhat outcurved in the middle and followed by 3 distinct, waved lines; hindwing basally and costally almost without markings. Underside of both wings more weakly marked than in *vetulata*, distally without markings, postmedian half-line of forewing much more strongly curved outwards. Achalzik, Transcaspia. *neglectata*.

Ph. senescens Stgr. is said to belong undoubtedly to this genus by structure, but to resemble so nearly light *montivagata* or *cervinalis* that it might even have been confused with them. Size of *transversata*. Light brown-grey, almost entirely covered with waved or dentate darker lines, forewing with sharply marked small dark discal lunule, median area broad, somewhat dark-shaded distally, the dark lines which traverse weak; proximal area with 4 closely approximated, weakly waved lines, bent or angled subcostally; antemedian (double) line rather straight, postmedian distinctly undulate and with a strong outward projection in the middle; all the lines somewhat darkened costally. Hindwing almost more deeply dentate than in *transversata*, discal dot and a line on each side of it inconspicuous, postmedian line distinct, strongly curved, slightly dentate, distally to it 2 further lines. Underside light clay yellow, both wings with distinct discal mark and (at least on the forewing) postmedian line and darkened distal margin. N. Persia, Armenia and N. W. Kurdistan. Cannot possibly be confounded with the darker *transversata*, with its quite differently shaped lines; from *Calocalpe montivagata* and *cervinalis* it also differs in its much lighter colour, the form of the median area and the light, dark-bordered under surface. *senescens*.

Ph. umbraria Leech (11h). Rather larger than *rhamnata*, palpus rather longer, anal tuft less enormously developed. The median band, connected with the strong apical streak, rather recalls *Horisme vitalbata*. Japan: Nagahama in July; Gifu. *umbraria*.

Ph. transversata Hufn. (= *rhamnata* Schiff.) (8b). Variable in colour but generally very constant in markings, forewing with all the lines sharply angulated near the costa, the postmedian with an unusually long, double projection at the 1st radial. The ground-colour is bright ochreous brown or dark brown, the lines darker, the median band sometimes almost dissolved into lines but oftener more or less solid, at times quite blackish. — ab. *hastedonensis* Lambill. is a melanotic form in which the brown ground-colour of the type form is in a large measure replaced by blackish. Described from Belgium, but occurs also near London. — The egg hibernates. The larva hatches as soon as the foodplant (*Rhamnus catharticus*) is coming into leaf and feeds up remarkably fast, being often full fed by the middle of May. In my experience it always feeds exposed and I have often found it sitting on twigs or branches; but some writers say it draws leaves together. It is stout, with well-marked segments; the commonest form is bright, rich green, with yellow lateral line and with purple markings on the last 3 segments, but purple-brown varieties also occur. Pupa much less glossy than that of *vetulata* and much darker in colour, dark red-brown with the wing-cases and anal end somewhat darker still. *transversata* is on the wing at the end of June and in July. It inhabits the greater part of Europe and also Asia Minor to N. Persia. — **japanaria** Leech is lighter, with the median area of the forewing not or not appreciably darkened. Oiwake, Japan. *transversata*. *hastedonensis*.

vashti.

Ph. vashti Btlr. (= christophi Hedem.) (11 e). Larger than *vetulata* and very much darker, also rather more glossy; anal tuft in ♂ less enormously developed. On the forewing the subterminal line is broken into a row of white dots and spots. Underside also glossy, both wings with the postmedian and its white edging indicated, forewing with some whitish dots at costa and on the veins, discal dots present; some examples more strongly marked. Japan, S. E. Siberia and W. China.

instabilis.

Ph. instabilis Alph. Only the ♀ has been figured, but the ♂ is said to show all the characters of the present genus. ♂ about 45 mm., ♀ 38—42 mm. Wings rather broad (at least in ♀) but with the apex of the forewing acute. Forewing pale grey, slightly tinged with brownish; extremely variable, the numerous waved transverse line differing much in strength of expression, often more or less united into bands, sometimes in part or almost entirely obsolete; subterminal line whitish, followed distally by a marginal shade, the two separating costally and limiting a pale, more or less triangular apical spot; nervures dotted somewhat as in *Triphosa dubitata*. Hindwing paler, weakly marked except towards anal angle, discal dot faintly indicated (wanting on forewing). Under surface very pale shining grey, with the markings of the upper more or less reproduced; both wings with discal dot. Western Thian-shan and Issyk-kul. According to the figure, the straighter direction of the lines should characterize this species.

50. Genus: **Telenomeuta** Warr.

Face scarcely protuberant, appressed-scaled. Palpus quite moderate, with moderately appressed scales. Antenna in ♂ almost simple. Hindtibia with all spurs. Abdomen not crested. Forewing ample, with distal margin oblique, somewhat convex, very weakly crenulate; areole long, single. Hindwing with distal margin conspicuously crenulate; discocellulars not biangulate.

Only one species known, inhabiting Japan and Central China. Its exact affinities are uncertain. LEECH placed the species in *Phibalapteryx* (= *Horisme*) but the abdomen is not crested and it seems likely to belong nearer to *Philereme*.

punctimarginaria.

T. punctimarginaria Leech (11 h) is recognizable by the extremely oblique distal edge of the median band, etc. Underside feebly marked, excepting a postmedian line on both wings. Japan and Chang-Yang July—August. Also on Formosa.

51. Genus: **Hysterura** Warr.

Face rather prominent, with appressed scales. Palpus with 2nd joint rather long, shortly rough-scaled, 3rd concealed. Antenna in ♂ shortly ciliated. Hindtibia with all spurs. Forewing with distal margin rather straight, oblique, the apex thus appearing more prominent than in *Eustroma*; areole usually double; inner-marginal area in ♂ (unless in *literataria*) with a more or less developed pencil of hair beneath. Hindwing with costa somewhat arched (especially in ♂), distal margin rather straight from the 1st radial to the 1st median, thence somewhat undulate (in ♂ *multifaria* strongly angled at 1st median); costal anastomosing rather shortly or quite moderately with cell; cell very short, discocellulars not biangulate; 1st median stalked.

Only 3 species are known, ranging from N. India to S. E. Siberia and Formosa. They are distinguished from *Eustroma* by their shape and pattern, the stalking of the 1st median of the hindwing and some secondary sexual characters.

multifaria.

H. multifaria Swinh. (= *declinans* Stgr.) (12 a). Distinguished from the other species by the shape of the ♂ hindwing, the broader median band, the very clear whitish line on the median vein and proximal part of the 3rd radial, more extended blackish markings distally to the median band, rather greyer hindwing, etc. On the underside of both wings there is a distinct dark discal mark and a dentate postmedian line, pale-edged distally, on the hindwing more deeply dentate, in the ♂ indeed strongly zigzag. Assam, Formosa and S. Ussuri; the Palearctic form (which I have not seen) may possibly constitute a local race, as STAUDINGER says it is more chocolate-coloured (less reddish) than the Indian *cervinaria* and this scarcely applies to typical *multifaria*.

literataria

H. literataria Leech (13 b) has the markings shaped nearly as in the Indian *cervinaria* Moore, the median band being much narrower posteriorly and terminating at the 2nd submedian vein; a series of 3 equal-sized subterminal blackish marks from costa where *multifaria* has an irregular and more extended series, traces of

the pale mark on median vein which becomes so conspicuous in *multifaria* and a much paler (whitish) hindwing, which is of normal shape. The single known example, a ♂, is unfortunately worn and it is possible that the hair-tuft beneath the forewing has been lost by abrasion, but I suspect that it is really wanting in this species. Pu-tsu-fong, W. China.

52. Genus: **Microlygris** *gen. nov.*

Related to the preceding and following genera. Palpus very long, 2nd joint stout, 3rd point smooth, rather elongate, exposed. Both wings, but especially the hindwing, angled at 3rd radial, slightly sinuate anteriorly and usually posteriorly to this angle. Forewing with areole double; ♂ (except in *erectaria*) with pencil of long light-coloured hairs near hindmargin of forewing beneath. Hindwing with costal anastomosing with cell to well beyond its middle; discocellulars not biangulate, but becoming strongly oblique; 1st median approximated but not stalked.

Type of the genus: *multistriata* Btlr. (*Cidaria*).

Geographical distribution N. India to Japan.

The long palpus, recalling the Neotropical *Psaliodes*, and the wing-shape separate it from *Eustroma*.

A. ♂ forewing with long pencil of hair beneath.

M. porphyriata Moore (= *multistriata* Btlr.) (12a). Forewing velvety brown traversed by numerous fine *porphyriata*. white lines, arranged chiefly in pairs but not all equally well expressed in all specimens; subterminal line single, deeply dentate and irregular, meeting an oblique white line which runs from the apex. Hindwing sometimes quite weakly marked, at other times with sharply expressed lines in the distal half except towards the costal margin. Both wings beneath similarly marked to forewing above, yet less sharply. Dharmasala to Assam. — **complicata** Btlr. (13a) from Japan and Korea is smaller and rather less variegated, the lines for the *complicata*. most part even more slender, the white subapical line of the forewing often obsolescent. WILEMAN has recently recorded the name-typical form also from Japan.

B. ♂ forewing without pencil of hair beneath.

M. erectaria Leech (13d). Lighter and more yellowish brown than *multistriata*, the 12 lines arranged in 3 *erectaria*. groups of 4, which separate brown areas; the middle group rather straight; the brown band which follows contains the discal ocellus; this is much larger than in *multistriata*, its dark pupil being expanded into a good-sized blackish-fuscous spot. Hindwing also with discal ocellus above, as well as beneath. Japan: Hako-date and Buno.

53. Genus: **Eustroma** Hbn.

Agrees in most characters with *Hysterura*. The palpus is usually rather shorter and stouter, but in order to avoid multiplication of genera a few species with moderately long palpi are provisionally included. Forewing with apex not acute, distal margin curved, not very oblique; areole always double; ♂ always with a hair-pencil near inner margin, in the typical forms this is long and black-tipped, arises from a quadrangular patch further from the base than the tuft in *Lygris* and posteriorly (not anteriorly) to the 2nd submedian vein, and covering a circular orange patch of (androconial?) scales. Hindwing with distal margin even, 1st median not stalked; in the typical ♂ forms with a second (androconial?) orange patch on the upper surface, occupying the position of the discal spot of the ♀.

The genus inhabits the Palearctic and Indian Regions and North America.

E. reticulata Schiff. (= dictyides *Wllgrn.*) (8 e). Forewing rather broad, the distal margin convex; *reticulata*. dark fuscous, paler and greyer between the 2nd and 3rd white lines and (except costally) between the 6th and 7th; most of the veins white; the character of the intricate white lines can be best seen from our figure. Hindwing often paler, especially in anterior part, costally at times white; ♂ with raised orange discal patch, ♀ with blackish cell-dot, both sexes with 2 whitish lines beyond the middle. Under surface paler and much more weakly marked; ♂ hair-tuft black except at its base. Generally not variable, but striking aberrations sometimes occur. — In ab. *ovulata* Borgmann the 4th and 5th white lines of the forewing meet at the costal *ovulata*. margin (or, rather, just before reaching it), so as to enclose an ovate dark patch. — Ab. *costimacula* Prout is *costimacula*. a much more curious aberration in which a broad (sometimes very broad) white suffusion runs along the

middle of the wing from the 2nd line to the 6th, or beyond, while the costal part of the 4th and 5th lines is obsolete, leaving a large dark costal blotch between the 3rd and 6th lines. — Larva slender, tapering gradually to the head; pale green with interrupted dull red mediodorsal line and white subdorsal, spiracles dull yellow, tubercles and setae black. On *Impatiens noli-tangere*; full-grown in September or October. Pupa short and stout, glossy, head, thorax and wings bright transparent green, abdomen golden-brown with darker incisions, a green dorsal line, a red-brown spot near anal end. The moth appears throughout July and is distributed in Europe, Siberia and W. China.

inextricata.

E. inextricata Walk. (= *aerosa* Btlr.) (13a) is similarly marked to *reticulata*, but very distinct. Larger, forewing with distal margin less convex, more oblique, the grey parts of the ground-colour replaced by yellow, 1st line more oblique, usually meeting the angled 2nd line before the hindmargin, the long-oval dark blotch at middle of hindmargin not divided into two by a white line, 4th and 5th lines anteriorly almost or quite parallel, 7th line (subterminal) more deeply lunulate-dentate, 4th subcostal vein towards apex as white as the others; hindwing also more tinged with yellowish, the rounded orange discal patch of scales of *reticulata* replaced by a more elongate black patch on the subcostal vein. N. India and W. China to Japan.

aurigena.

E. aurigena Btlr. (13b). Size of *reticulata*; more glossy, forewing strongly suffused with bronzy green, the fuscous median patch much narrower, the narrow grey bands of *reticulata* being replaced by much broader green ones, which are divided at costal margin by additional white lines, subbasal fuscous patch similarly divided, so that there are at least 10 white lines costally; postmedian line anteriorly and apical streak rather thick. Hindwing glossy fuscous. ♂ antenna with longer ciliation, ♂ hairtuft concolorous with under surface, no tuft on hindwing above. Kashmir, etc.

fissisignis.

E. fissisignis Btlr. (= *reticulata* Moore nec Schiff., = *chrysoprasis* Ob.) (101 as *chrysoprasis*) nearly agrees in structure with *reticulata*, though the palpus is longer and the tuft of orange-brown scales on the upperside of the ♂ hindwing more elongate. Superficially very distinct in its much larger size, more elongate wings and different colour and pattern. Ground-colour above and beneath fawn-colour, the hindwing above predominantly white; the blotches on the forewing above blackish brown with a slight olivaceous tinge. Both wings beneath with dark cell-spot and thick postmedian line, that of the hindwing dentate; forewing in addition with a blurred dark suffusion in the median area or sometimes with the dark blotches of that area formed nearly as above. W. China: Ta-chien-lu and Pu-tsu-fong, June-July. Also in Sikkim and Indian Tibet.

fractifasciaria.

E. fractifasciaria Leech (13d). Similar to the preceding but rather smaller and with the dark markings differently arranged; those nearest to the base much narrowed, the next restricted to dark costal marks; the costal spot of the median area less uniform in size and shape, the posterior blotches united into one; no conspicuous dark spots distally to the median area, only a weak darkening towards the distal margin; pale subterminal line much better developed than in *fissisignis* and deeply lunulate-dentate. Hindwing rather darker than in *fissisignis* with distinct black discal dot on upperside. The unique ♂ is worn, the orange tuft on upperside of hindwing wanting (perhaps abraded). In the same localities as the preceding; May-July.

propriaria.

E. propriaria Leech (13d). Related to the two preceding, structure as in *fissisignis*, size of *fractifasciaria*. Ground-colour similar or sometimes rather more reddish. The black-brown colouring is restricted to two thick lines or narrow bars which limit the central area and two fine lines which traverse it; otherwise the markings are red-brown and consist only of a basal patch, median band and some indistinct spots distally to the subterminal; median band entire, variable in width (rather narrow or moderate, widest anteriorly), its edges indented at the folds — in one example with the part distally to the submedian fold quite isolated as in *Cidaria silaceata* ab. *insulata*; subterminal line very indistinct, mostly broken into dots. Hindwing white somewhat suffused with grey and with a grey postmedian line. Under surface somewhat suffused with grey from the base to the postmedian line, especially on the forewing; discal marks somewhat elongate. In the same localities as the two preceding; May-July.

melancholica.

E. melancholica Btlr. (= *chlorovenosata* Chr.) (71) differs from the preceding group in the absence of the orange scale-tuft on the hindwing; the hair-pencil on the forewing beneath is yellowish and the palpus is long, so that, but for the non-angulate discocellulars the species would belong to *Lygris*. Superficially *melancholica* strongly suggests a large, long-winged *Cidaria silaceata*; indeed with the exception of the larger size and relatively rather longer wings and the ♂ hair-pencil I can find scarcely any constant differences, but the much more deeply angled antemedian line of *melancholica* should suffice; as a rule, the ground-colour is more dusted with bright yellow, the wedge-shaped markings between the postmedian line and the apex are longer and the discal spots larger and placed much nearer the antemedian line. Variable in colour. BUTLER'S

types from Tokio and Yokohama are darker than usual. Distributed in Japan. — *venulata* Ob. (8 e) seems *venulata*. to be merely a more variegated aberration, especially characterised by the yellow-edged costal patch in the middle of the median band. Isle of Askold. — *venipicta* Warr. (= *brunnearia* Leech, *pilosa* Th.-Mieg) *venipicta*. differs in having a strong red-brown tone on both wings above and beneath, the median band more broadly broken in its posterior part by red-brown veins. Pu-tsu-fong. Also at Darjiling.

E. mardinata Stgr. is unknown to me and the structure of the discocellulars is not mentioned, but I *mardinata*. suspect it is a *Eustroma*. Size of *reticulata*. Forewing light violet-grey with light brown-black markings consisting of basal patch, median band and subapical streak; median band divided into two by a paler band, which contains the dark cell-dot; its proximal edge curved, its distal nearly vertical from costa to middle, here rounded or bluntly angled, the posterior half somewhat incurved; apical streak weakly bidentate; a black terminal line; fringe weakly chequered. Hindwing concolorous, with weak, bluntly outcurved postmedian line. Underside of both wings with distinct postmedian line; no cell-spot; the hair-tuft dense, brownish. Mardin, taken in August.

E. (?) metaria Ob. (10 l) is also unknown to me, but I refer to it here on account of its great similarity *metaria*. in markings to *fissisignis* Btlr., from which, however, it may be at once distinguished by their arrangement. We reproduce OBERTHÜR's figure. He adds scarcely any description and it must be remarked that if it has the *Eustroma* hair-tuft beneath both he and his artist must have overlooked it; in any case it has not the orange discal scale-tuft on the hindwing above. Forewing beneath slightly smoky as far as the postmedian line, which shows a deep indentation behind the first radial; beyond the postmedian the colour is at first white, then brownish with a white subterminal line. Hindwing beneath somewhat dusted with grey and with a distinct dark discal spot and angulated postmedian line; distal area as in forewing but rather greyer. Ta-chien-lu.

54. Genus: **Paralygris** Warr.

Perhaps a subgenus of the preceding, the principal difference being that the σ^7 antenna is bipectinate. The 2nd and 3rd joints of the palpus are both elongate, the former shortly rough-scaled, the latter smooth, exposed. The hair-tuft beneath the forewing in the σ^7 is light-coloured and spreading; I have not been able to study its point of origin.

Founded by WARREN for a single species, which is only known from W. China.

P. contorta Warr. (= *delecta* Leech nec Btlr.) (12 a) is remarkably like the well-known Indian species *contorta*. *Cidaria delecta* Btlr., except in structure, in having the white markings broader and in the more strongly marked hindwing with considerably enlarged discal spot. W. China: Omei-shan, Mou-pin and Chia-ting-fu; May-July.

55. Genus: **Callabraxas** Btlr.

Face smooth. Palpus short, shortly rough-scaled. Antenna in σ^7 minutely ciliated. Hindtibia with all spurs. Wings rather elongate, but with the costa of the hindwing strongly arched. Forewing with areole double; σ^7 provided with scent-hairs in posterior part beneath. Hindwing with discocellulars not biangulate.

I only know two species, not very closely related, but readily distinguished from *Eustroma* by their larger size, longer wings and mimetic resemblance to the Abraxids. In the type species, from India, the σ^7 has 2 long tufts of white hair and 2 short tufts of dark hair on the forewing beneath. In the Palearctic species the structure of the scent-organs is quite as in *Gandaritis*.

C. maculata Swinh. (as *Gandaritis*) (11 i). Superficially nearest to *Lygris agnes*, but very distinct from *maculata*. any known species of the subfamily. Considerably smaller than *agnes*, the base of the forewing not yellow, the bands all broken into rows of separate elongate internervular spots. Beneath similar, the spots rather larger and darker. Japan.

56. Genus: **Calleulype** Warr.

The characters, including the mimetic resemblance, nearly as in the preceding genus but with the areole commonly single, discocellulars of the hindwing biangulate.

Distribution from Western China to Japan.

Like the preceding genus, this is divisible into two sections according to the σ^7 characters.

A. ♂ without hair-pencil on forewing beneath. Areole always single (*Calleulype* Warr.).

whitelyi.

C. whitelyi Btlr. (8e). Wings rather broad, the margins well rounded. I know of no species with which it is likely to be confused. Perhaps nearest in general aspect to *Cidaria placida* Btlr. (8e) but that has long palpi, some yellow at base of forewing, yellow fringes and differently arranged dark spots (those in the central area of the wing much the broadest). Face and crown of head blackish, in *placida* yellow. The underside is marked like the upper. Variable in the extent of the markings. Distributed in Japan; also in Korea and the Ussuri district. June-July.

B. ♂ with strong hair-pencil on forewing beneath, as in *Lygris*. Areole single or double (*Callygris* Th.-Mieg).

compositata.

C. compositata Guen. is unknown to me in its typical form, which, however, only differs constantly from the common *junctilineata*, here figured, in the absence of the large black discal spot on the upper surface of the hindwing. M. OBERTHÜR writes me that GUENÉE's type is not in worn condition, so that the absence of the spot is not due to abrasion; moreover he possesses a specimen from Leou-fang in which this spot is absent also beneath, whereas in the type it is there present. GUENÉE's example was from N. China. — ab.

*junctiline-
ata*.

junctilineata Walk. (8d), common in N. China and Japan and extending across China, is to be distinguished by having the large discal spot of the hindwing well developed on both surfaces. It is decidedly variable and the upperside often lacks (as does that of the name-typical form of the species) the postmedian lines of the hindwing. The only specimen I have seen from W. China (Ta-chien-lu) lacks also the apical black markings

constricta.

of the hindwing, which thus resembles that of *L. ludovicaria* (8d). — ab. **constricta** (Warr. M. S.) *ab. nov.*, from N. China, has the antemedian and postmedian lines of the forewing curved anteriorly, so as to meet at or before the costal margin; discal spots as in *junctilineata*. — The areole in *compositata* is very inconstant; I have counted 13 in which it is single, 13 double and 1 asymmetrical.

57. Genus: **Lygris** Hbn.

Face with cone of projecting scales. Palpus with 2nd joint rather long, usually rough-scaled, 3rd joint smooth, moderate or rarely short. Antenna in ♂ ciliated, in a few American species pectinated. Hindtibia with all spurs. Abdomen in ♂ long and slender, the extremity strongly curved upwards in repose. Wings of moderate breadth, the apex of the forewing usually rather acute, the coloration generally straw-colour or yellowish. Forewing with areole double (exceptionally single in *plurilineata*); the ♂ usually with a strong pencil of yellow hairs arising from a triangular area close to the base beneath, just anteriorly to the 2nd submedian. Hindwing with costal margin arched, discocellulars strongly biangulate.

Egg rather large and strong, the narrower end strongly truncate and flattened; surface not glossy, regularly granulated; hibernating. Larva when first hatched very thin, slightly flattened, brown or yellow with dark dorsal band and subdorsal line; when full grown moderately elongate, nearly cylindrical, head and prothorax rather small, mesothorax usually somewhat swollen, anal extremity without the pointed processes of some of the allied genera. Feeds up rather rapidly in the late spring, undergoing 3 moults. Pupa among leaves, spinning a few threads; green or light brown, variegated, with dark dorsal and ventral lines and usually dark markings on the wings; cremaster rather long, with the terminal hooks well developed. The pupal stage is of short duration and the moths are mostly on the wing in the height of the summer.

A very natural genus, characteristic of the Palearctic and Nearctic Regions. There is but little structural variation (chiefly in the palpi and the ♂ antennae), yet the species are mostly clearly defined and present few, if any, intricate problems of differentiation. Our figures will render determination quite easy and safe and the notes below refer chiefly to the variation, except in the case of the few little-known species.

A. Palpus with 3rd joint concealed; wings broad, distal margins smooth, that of hindwing ventricose; ♂ hair-tuft normal (*Chartographa* Gmpbg.).

ludovicaria.

L. ludovicaria Ob. (= *tigrinata* Chr.) (8d). I select this as the type of *Chartographa* Gmpbg. Very distinct from the other species of *Lygris*, transitional in structure towards the subgenus *Callygris* of *Calleulype*, palpus quite moderate. Like *Calleulype* it is mimetic of *Abraxas*. On the under surface both wings have a large black discal spot, the forewing a black postmedian band and black marks at apex and hinder angle; hindwing with black postmedian costal spot and margins as above. Ussuri and Korea to W. China, June—early August.

L. plurilineata *Walk.* (11i). Much smaller than the other species of *Lygris*. Pattern of forewing not *plurilineata*, entirely dissimilar to that of *ludovicaria*, but with the 15 lines more equidistant, not grouped in fours, the ground-colour very pale yellow, not white. Forewing beneath with the lines broadened, the distal pairs united into bars; hindwing beneath paler than above, with large discal spot, a bar between the cell and the fold, two thick curved lines behind the cell-spot, then a row of large spots, finally a dark apical spot, much smaller than above. Palpus longer than in *ludovicaria*, stout and long-scaled. N. E. China: Ningpo to the Nan-kow Mountains.

B. Palpus with 3rd joint exposed; wings less broad, distal margin of forewing often flexuous, of hindwing not ventricose; ♂ hair-tuft normal (*Lygris* *Led.*).

L. fabiolaria *Ob.* has been already figured in vol. 2, pl. 23f, although Dr. STRAND expressed a suspicion *fabiolaria*. (p. 196) that it would prove to be Geometrid. It is a beautiful mimic of the genus *Abraxas*, but the structure is typically that of *Lygris* except that the 2nd joint of the palpus is rather more smoothly scaled; 3rd joint rather short. The midcostal blotch is rather browner than in our figure. I have before me LEECH's series from several localities in Central and Western China.

L. prunata *L.* (= *ribesaria* *Bsd.*) (8e). This handsome species also differs somewhat in facies from *prunata*. the more typical species, the rich, variegated brown colouring and the triangular dark markings before the subterminal line rather recalling *Cidaria silaceata* beneath paler, but with most of the markings present in the distal half. It occasionally varies, but scarcely sufficiently to justify the many names which have been imposed on its less typical forms. — ab. **digna** *Th.-Mieg* (= *ochraceata* *Lambill.*, *flavicata* *Sp. Schneid.*), first described *digna*. but not named by GUENÉE, has the ground-colour of the forewing pale ochre-yellow, the markings, with the exception of the dark central band, weakly expressed, the hindwing also paler than in the type, with black postmedian line. — ab. **schwederi** *Teich* differs little from the type on the upper surface, though the distal *schwederi*. margins are darker, especially on the hindwing. Beneath both wings are blackish grey, only with a yellowish-white line beyond the postmedian. 2 examples near Riga. — ab. **constricta** *Strand* (= *interrupta* *Hirschke*) *constricta*. has the median band narrowed and broken, the posterior one-fourth being cut off as a separate oval spot. — **annexa** *Schima*, from Herzegovina, has the band distally more strongly dentate, its proximal and distal bordering *annexa*. more mixed with golden yellow; the dark patch on the termen is altogether wanting. — **arctica** *Strand*. *arctica*. According to its author, specimens from Arctic Norway are usually smaller with weaker markings but darker marginal area. SCHNEIDER, however, does not think this constant. The adult larva is variable in colour and in the strength of the markings; green or variegated with greys and red-browns; a V-shaped dorsal pattern; a black collar on the swollen mesothorax, with whitish tubercular dots. On species of *Ribes*. Central and Northern Europe and many parts of Asiatic Russia.

L. testata *L.* (= *colorata* *F.*). The name-typical form, which is prevalent in the north of Europe and *testata*. in Canada, has the yellowish ground-colour strongly suffused almost throughout with testaceous, so that that becomes altogether the prevailing colour. Underside of forewing almost unmarked as far as the postmedian line; of hindwing with 2 well expressed dark lines (only indicated above). — **achatinata** *Hbn.* (8e, as *testata*) *achatinata*. is much more brightly coloured, the basal and median bands and the terminal patch on the forewing bright orange-yellow. Also generally a little larger than the type. Only occurs in more southern localities. — **insulicola** *Stgr.* is considerably darker than the type, of a reddish brown colour; in general also somewhat *insulicola*. narrower-winged. STAUDINGER records it from the Shetlands and Hebrides and I have examples from the Isle of Arran. — **achatinellaria** *Ob.* (8e), from Eastern Siberia, has the proximal edge of the median band of the *achatinellaria*. forewing deeply angled and a more distinct dark cell-spot present above, besides other differences, and is likely to prove to be a separate species, although according to STAUDINGER transitional forms occur in Mongolia. — Larva a rather pale yellowish brown, often with some tinge of green; weakly marked, the most conspicuous marking being a dark dorsal line; rather more slender and regularly cylindrical than that of *prunata*, anal flap somewhat pointed. On sallow, birch, etc., feeding chiefly at night. The moth appears rather later than most of its congeners, chiefly in August and September.

L. populata *L.* (8f). Very variable in colour, but pretty constant in the shape of the median band, *populata*. with its characteristic bilobed distal projection. Beneath this band is ill-defined proximally and the hindwing is rather less pale and more strongly marked than above, with a distinct discal dot. We figure a rather darkly marked example. — ab. **dotata** *L.* differs in being more uniformly coloured, somewhat recalling *mellinata*; the *dotata*. median area of the forewing, though sharply marked at its boundaries, encloses little or no dark filling. — ab. **lutea** *Strand* (= ? *pallidata* *Lambill.*), said to be chiefly prevalent in Arctic Norway, is a more extreme *lutea*. development than *dotata*. Forewing almost uniform clear yellow, only the postmedian line distinctly indicated and even this sometimes nearly obsolete; hindwing whitish, almost or quite unmarked. — ab. **circumscripta** *Strand* has the basal and median dark areas of the forewing well developed and joined together both on costa *circumscripta*.

- rufescens*. and hindmargin, enclosing a small pale area in the middle. — ab. **rufescens** *Gmpbg.* is described as ferruginous-ochreous, the median area infuscated, not paler in the middle, the hindwing with a dentate dark line and reddish border. — ab. **musauaria** *Frr.* is much darker than the type, dark reddish brown with the margins of the central area indicated in blackish, a pale (or even white) line from costa to the 3rd radial often remaining conspicuous distally to the postmedian; hindwing also somewhat smoky. A frequent form in some localities (Scotland, N. England, the mountains of Silesia, Bavaria, etc.) but quite wanting in others. — ab. **fuscata** *Prout* is a more extreme and much rarer development. Both wings uniformly blackish fuscous, the markings altogether obliterated. I have only seen it from Scotland; BARRETT figures one on pl. 361, fig. 3 c of his well-known work. — Larva rather slender, nearly cylindrical, head and prothorax small, mesothorax slightly swollen; variable in colour, grey, brown or green, more or less darkened mediodorsally and usually with a pattern of small somewhat V-shaped dorsal markings at the ends of the first 5 abdominal segments. It feeds chiefly on *Vaccinium*, but also on heather and willow. Imago in July and August. Central and Northern Europe, parts of Siberia and Kamtschatka.
- perspicuata*. **L. perspicuata** *Püng.* differs from *populata* in having the basal and median areas and distal marginal patch sharply dark brown, the proximal edge of the median area angled in the middle, not rounded, and the ♂ antenna thicker, with the joints not angularly projecting. The ground-colour of the forewing is similar to that of *populata*, the hindwing is grey-dusted and has 2 whitish lines. Underside paler than upper, the forewing pretty uniformly darkened from base to postmedian. Koko-nor.
- peloponnesiaca*. **L. peloponnesiaca** *Rbl.* Ground-colour as in *mellinata*, but very distinct in the dark brown colouring of the basal area and median band of the forewing and in having the latter broadly interrupted before the hindmargin (isolating a small dark spot between the 2nd submedian and the margin). Palpus with 3rd joint distinct. Antennal joints in ♂ with sharply projecting ends. Shape of wings similar to that of *prunata*. Basal area of forewing broad, with blunt projections, bisected by a pale line and distally edged with white; median band also white-edged, broadest at costa, here enclosing a small, dark-pupilled pale space; apex with dark oblique line, termen from here onwards somewhat darkened. Hindwing pale yellow-grey with a darker postmedian line. Underside yellow-brown with dark cell-dots (that of the forewing weak) and postmedian line, forewing darkened distally; ♂ hair-tuft yellow-brown. The larva was discovered on gooseberry and PÜNGELER has bred it from the egg. Larva in April-May, moderately slender, slightly flattened, tubercles white; colour usually light green, with dark dorsal line and white subdorsal and ventral; a rarer brown variety recalls *prunata* larva. Imago in June. Taygetos, Morea, at elevations of over 1000 m.
- mellinata*. **L. mellinata** *F.* (= *associata* *Bkh.* = *marmorata* *Hbn.*) (8 f, as *associata*). Scarcely at all variable and easily distinguished from *populata* ab. *dotata* by the differently shaped central area; the more strongly spotted fringes are also distinctive. Larva elongate, cylindrical, yellow-green with darker, more bluish green dorsal line, which is finely white-edged, very fine white subdorsal and fine white lateral. On *Ribes rubrum* and *nigrum*, preferring the former; it feeds at night and is extremely sluggish. Full-fed in June. Pupa bright green, the markings brown. Inhabits a great part of Central Europe and Russia and the Altai and Changai Mountains.
- destinata*. **L. destinata** *Möschl.* (7 e). An Arctic species and not yet known from the true Palearctic Region, being only recorded from Labrador. Closely related to *prunata*, but of a much duller, greyer tone than the normal forms of that species; best distinguished by the different shape of the basal patch, which shows a single, rather sharp angle. According to MÖSCHLER a very variable species. — ab. **lugubrata** *Möschl.* is said to be darker, having both wing infuscated, with less markings and these less distinct. MÖSCHLER's type was blackish with lighter median area, and with fine white lines. Possibly a local race in some parts of Labrador.
- ledereri*. **L. ledereri** *Brem.* (8 g). Nearly related to *testata*, both wings with a similar glossy testaceous ground-colour, but rather darker and with still less yellow admixture. Much larger, the antemedian white line very oblique, joining the postmedian line on the 2nd median vein; subapical patch conspicuous and as distinctly expressed beneath as above; underside otherwise similar to that of *testata*. Ussuri district and Japan.
- roessleraria*. **L. roessleraria** *Stgr.* (8 g) is suggestive of a smaller, paler edition of *ledereri*, but has the markings better defined, the basal dark part extraordinarily obliquely margined and ending in some characteristic marks at the hindmargin; median costal patch narrower, with a whitish costal mark in its centre. Under surface clearer and more yellowish, the type of marking more recalling *populata* than *testata*. Found in the Taurus, perhaps also in the north of Asia Minor.
- convergenata*. **L. convergenata** *Brem.* (8 d) is again very distinct in having the markings more broken up into lines, the first 3 extremely oblique; some dark, ochreous-mixed markings at the posterior angle of both wings further approximates this species to *ludovicaria*, but it is abundantly distinct in colour and pattern. The long palpus associates it with the *ledereri* group. S. E. Siberia and Japan.

L. pyropata Hbn. (8 g). A very elegant species, the wings strongly glossy, with broader white margins to the median band costally than in most *Lygris*. The median band is not normally quite so dark as in our figure. Under surface rather weakly marked. Russia and the Ussuri district, also, though very rare, in N. E. Germany. *pyropata*.

L. pulchraria Leech (13 n) is closely related to *pyropata* but has a darker ground-colour (more reddish), darker markings, reduced proximal area and in general more angulated markings. The hindwing is clearer white with better defined dark markings, which sometimes extend over most of the wing. W. China, June-July. *pulchraria*.

L. albicinctata Püng. is described as: "Near *pyropata*, the markings of the forewing similar, the colouring quite different, dull brown, the basal area, the median band and the marginal patch behind the apex darker brown, all with fine white edging, which stands out specially sharply on both sides of the median area costally. Hindwing whitish, in the basal part very weakly, before the distal margin more strongly dusted with grey. Underside similar to that of *pyropata*, but greyer. Described from 1 ♂ from Koko-Nor". The figure shows that it differs from *pulchraria* in more uniform colouring, narrower median band, finer white lines, the post-median indented at the 1st radial, the white apical streak short, etc. *albicinctata*.

C. Palpus long; structure of ♂ forewing as in *Gandaritis* (*Christophiella* Berg).

L. agnes Btlr. (11 h). Very Abraxine in its appearance, with yellow body, yellow base of forewing and dull black markings; sometimes the costal margin of the forewing is yellow-dusted nearly to apex. Decidedly variable; median band usually nearly solid, somewhat spotted with white, occasionally much broken up; marginal area in BUTLER'S type black with traces of deeply dentate white subterminal, oftener with the subterminal broader. Japan. — **festinaria** Chr., from the Ussuri district, is said to differ in having the yellow costal dusting confined to the base and the marginal bands of both wings more broken up into spots; perhaps nearly a synonym or quite an unimportant aberration. Some Japanese examples have the bands much broken up. — In the present species the peculiar secondary sexual modifications of the forewing are even more strongly developed than in typical *Gandaritis*; in *pyraliata*, on the other hand, they are very slight *agnes*. *festinaria*.

L. pyraliata Schiff. (= *populata* Cl. nec. L., *dotata* Stgr. nec L.) (8 g). Forewing slightly narrower than in the other yellow *Lygris* species to which it bears the nearest resemblance; also generally recognizable by the narrow central area, the row of dark spots beyond the postmedian line and by the darkened (but not spotted) fringe of the forewing. Under surface more strongly marked, especially that of the hindwing, which has a brown or fuscous cell-spot, a larger spot near the anal angle, etc. — ab. **deleta** Strand (8 g). Much more weakly marked, only the two lines of the forewing remaining on the upper surface and even these usually weakened. Fringe not darkened. Our figured example is not at all an extreme one and unfortunately the markings have been depicted rather too strongly. — ab. **johansonii** Lampa is an aberration with the distal part of the forewing grey-brown. Sweden. STAUDINGER'S diagnosis is erroneous. Larva slender, cylindrical, green with dark mediodorsal and whitish subdorsal and ventral lines; spiracular line fine, yellowish. It feeds on *Galium*, especially *G. aparine*. On the wing in July and August, often very plentiful. Distributed in Europe (except the South-west), Asia Minor to Central Asia and throughout a great part of Siberia. *pyraliata*. *deleta*. *johansonii*.

D. ♂ forewing without secondary sexual modifications.

L. flavomacularia Leech (11 h). Quite distinct from any other known species, though showing some indications of relationship with the species of *Gandaritis*; distal margin of forewing slightly less oblique. The markings of the upper surface are shown in our figure. Beneath the ground-colour is ochreous yellow, becoming whitish at the hindmargin of the forewing and white, sparsely dusted with fuscous, on the hindwing from subcostal to inner margin and from base to beyond middle; both wings with fuscous cell-spot, double post-median line, row of subterminal spots and some terminal clouding. Wa-shan, August. *flavomacularia*.

L. intersectaria Leech (11 h). Of this species I only know a single example and although it is a ♂ I am somewhat doubtful as to its exact generic position. It may perhaps best be compared with *trigonioplaga fabiolaria*, but the palpus is still shorter, appressed-scaled, nearly as in *Callabraxas*. From *fabiolaria* it differs markedly in that the brown markings of the forewing are much darker, almost black, and all greatly extended, while the grey shading is entirely wanting; on the hindwing, on the contrary, the dark markings are greatly reduced, in part obsolete. Underside the same, but with the markings of the forewing somewhat more blurred. Omei-shan, taken in July or August. *intersectaria*.

58. Genus: **Gandaritis** Moore.

Face more or less tufted. Palpus rather long, 2nd joint stout, shortly rough-scaled, 3rd joint exposed, smooth, of moderate length. Antenna simple. Hindtibia with all spurs. Wings rather narrow, but the hindwing with costal margin arched nearly as in *Photoscotosia*. Forewing with areole double. Hindwing with cell very short, costal anastomosing rather shortly, discocellulars not biangulate, but very oblique, 2nd radial arising from or from somewhat above the middle.

Early stages unknown.

A very small Asiatic genus (N. India to Japan) consisting, as here restricted, of only 2 or 3 species, which are evidently closely related notwithstanding the absence of the secondary sexual modifications in *fixseni*. Differs from *Lygris* sections C and D in the discocellulars of the hindwing, from *Eustroma* in shape and habitus, in the secondary sexual characters of the ♂ and usually in the form of the palpus.

A. ♂ with 2nd median and submedian fold of forewing curved towards one another, a small hair-fringed scar at their point of approach, provided with sharp spines and followed by a shallow scaleless depression (fovea).

flavata. **G. flavata** Moore is the type of the genus; the ♂ is sufficiently distinguished by the sexual characters, but both sexes may further be known by the distinctly *double* subbasal, antemedian and postmedian lines of the forewing, the indentations in the antemedian and usually by the deeper colour and stronger grey clouding. The typical form, from Bengal, is comparatively weakly marked, the hindwing yellow with ferruginous postmedian line and distal margin. I do not know whether it reaches the Palearctic Region. — *sinicaria* **Leech** (= *reduplicata* Warr.) (11e), which seems to be distributed throughout China, has the basal two-thirds of the hindwing white (or in the form from N. China, which we figure, partly white and partly pale yellow) and bears 3 blackish bands between discal dot and distal margin, the second strongly dentate, the third diffuse, sometimes reaching nearly to the margin, sometimes broken up into spots.

B. ♂ forewing without secondary sexual modifications.

fixseni. **G. fixseni** Brem. (8f). Nearest to the *sinicaria* from of *flavata* but without any white in the hindwing, the bands much narrower, the second almost or quite broken up into triangular spots, the third well defined, composed of larger spots. Third joint of palpus rather longer. Variable in depth of colour, width of bands and in the amount of the dark clouding. ♀ clearer yellow, rarely very strongly dark-clouded. Amurland, *magnifica*. ? Korea. — **magnifica** *subsp. nov.* (8f), from Japan, is a much larger race which I at first believed to be a distinct species showing greater affinity with *flavata*. But on examination of the structure and of a longer series, I now consider it to be merely a form of *fixseni*. Excepting the size I can point to no constant distinction, both forms being so variable; but although in some Japanese localities examples occur which are not so large as those here figured, I have never seen any so small as the typical, Amurland form.

59. Genus: **Cidaria** Tr.

Face more or less prominent, generally rough-scaled or with projecting cone of scales, palpus moderate or longish, rough-scaled, wings normally shaped, without secondary sexual modifications, the costal vein of the hindwing anastomosing strongly with the cell. An areole is always present, oftenest double but sometimes simple; the discocellulars vary greatly in form; tongue and frenulum are always developed; abdomen never crested beyond the first few segments.

It will be observed that the above characters are nearly all, in a sense, *negative*, in other words, that LEDERER left in *Cidaria* all the species which did not show some abnormal character in shape, neurulation, leg-structure, etc. GUENÉE's subdivisions were too unscientifically grounded to need consideration, but MEYRICK found some useful characters in the face, the areole and the ♂ antenna and HAMPSON in the form of the discocellulars, while TURNER, by combining the work of these two systematists, reached the best results which have yet been arrived at on imaginal characters alone. It must be admitted, however, that the antennal distinctions, besides being applicable to one sex only, do not always give entirely natural groupings. In the following synopses they may be assumed to be simple unless the contrary is indicated.

The eggs are generally of a very simple form, ovate, moderately smooth, with slight hexagonal or polygonal reticulation. The larvae show, at least as clearly as the moths, how unnatural the genus is. They

vary from extremely elongate (as in the subgenus *Chloroclysta*) to stout and rugose (as in some *Calostigia*), some of the more slender larvae showing projecting anal points similar to those of the *Lobophora* group. The pupae of many species hibernate and these are nearly always enclosed in earthen cocoons and agree with most subterranean pupae in their glossy surface and red-brown or blackish-brown colouring. Those of the earlier subgenera, however (*Cidaria*, sens. str., to *Dysstroma*, which constitute LEDERER's group A, with exerted ♂ anal clasps), usually pass quite a brief period in the pupal state, spun by a few threads among leaves, and are often green in colour and on an average of a somewhat more slender texture.

The genus *Cidaria* is of world-wide distribution. The species which penetrate furthest into the Arctic Region belong here and so do some of the inhabitants of Tierra del Fuego.

Subgenus *Cidaria* Tr. Face without cone of scales. Areole double. Discocellulars strongly oblique, not biangulate.

C. fulvata Forst. (= *cuspidata* Thnbg.) (8 g). Forewing in the name-typical form rather deep yellow. *fulvata*. Hindwing yellowish white, unmarked, with fringe more yellow. Distributed throughout the greater part of Europe, Asia Minor, Transcaucasia, N. Persia, the Altai and Kentei Mountains. — ab. **degenerata** ab. nov., *degenerata*. founded on a specimen taken in the Isle of Man and figured by MOSLEY and by BARRETT, has nearly the coloration of the following form, but the median band is dark and very much narrowed and broken into a larger anterior and smaller posterior section. — **distinctata** Stgr. (8 g, as *distinctaria*) has the forewing less *distinctata*. mixed with red-yellow, the basal patch, however, whitely red-brown, the median band similarly coloured, usually narrower (sometimes much narrower) in its posterior part than in *fulvata*, and there is a subterminal row of brown spots. Central Asia: Zerafshan, Ferghana, Issyk-kul, etc. — Larva rather long and slender with 2 well-developed anal points, bluer green dorsally, yellower green ventrally, with yellow lateral line; head rather small, prothorax slightly swollen. On rose in May. Pupa spun by a few threads among leaves; bright yellow-green, wings more grass-green, dorsal line scarcely darkened, a whitish subdorsal; cremaster reddish brown. On the wing at the end of June and in July.

C. nugata Feld. (= *kashmirica* Moore) (13 o). I have only seen figures (FELDER's and a copy of MOORE's *nugata*. type), both representing the ♀, and am not sure that this is anything more than a slight modification of *fulvata* *distinctata*. Rather larger, the basal patch and median band rather lighter red-brown, the former less entirely filled in (intermediate towards typical *fulvata*), the latter apparently sometimes (FELDER's figure) broader. Hindwing sometimes with traces of a dark postmedian line which is entirely wanting in *fulvata* and *distinctata*. Kashmir.

C. ochracearia Leech (= *propinqua* Warr.) (13 o) ♂. Much deeper-coloured than *fulvata*, bright reddish *ochracearia*. fulvous, the ground-colour of the hindwing not darker than that of the forewing; forewing with basal area sometimes and median area usually darkened with red-brown, marginal area (except the pale apex) usually much clouded with red-brown, a pale subterminal line present, though indistinct in places. Hindwing with traces of an angled postmedian line. ♀ unknown. Distributed in W. China (Omei-shan, Ta-chien-lu, etc.). The shape of the median band seems to differentiate it sufficiently from both the preceding species; proximally the band is scarcely dentate, except that it has a single, pointed projection inwards in the middle; distally its central projection is single, not double. The ♀ will probably prove to be much lighter and the species may have to be united with the following.

C. ochripennis nom. nov. (= *ochreata* Stgr. nec Moore). From the description it is clear that this is *ochripennis*. closely allied to the preceding, but the ♂ is described as *deep ochreous-brown*, the inner edge of the median band has a *very sharp* angle in its middle, the projection in its outer edge is *broader and rounder* than in *fulvata*. All else seems to agree essentially. The ♀ is larger, dark straw-yellow with darkened median band and strongly marked underside (that of the ♂ is weakly marked). Koko-Nor district, Tibet.

C. fractistriga Alph., described from a single worn ♀ and doubtfully referred by its author to *Epifidonia*, *fractistriga*. probably rather belongs here, as LEECH suggests. Both wings bright orange yellow, the forewing with fuscicent antemedian and postmedian lines, the former curved, the latter commencing rather near it on the costa, but outcurved, strongly angled at the 3rd radial, then again slightly curved, but running nearly perpendicularly to the hindmargin; the convexity of both the curves is directed towards the base of the wing. Hindwing unmarked. Forewing beneath more strongly mixed with grey, the postmedian straighter. Ou-pin (Gan-su), taken on 6 July.

Subgenus *Lyncometra* subg. nov. Face with projecting scales. Palpus strong. Metathorax crested. Forewing with areole double. Hindwing with discocellulars biangulate. ♂ with strongly exerted anal clasps.

ocellata. **C. ocellata** L. (= *lynceata* F.) (8g) differs from nearly all the species of this group in its dense, glossy scaling, as well as in the early stages and, notwithstanding some points of agreement, in the genitalia. I doubt whether it is closely allied with them. Scarcely variable except in the width of the median band of the forewing and at once recognizable by the coloration, the weakly-marked distal area of the forewing, almost unmarked hindwing, etc. — ab. **coarctata** Prout. Median band extremely narrow; figured by BARRETT, Lep. Brit. pl. 338, fig. 2b, but I have seen one still more striking example, in which the band is thread-like, in the middle of the wing altogether interrupted. — Larva stout, tapering anteriorly; head small; body pale reddish brown, dorsally with 5 or 6 large V-shaped pale marks, their points directed backwards, ventrally with some V-shaped marks pointing forwards. On *Galium* in the summer months, feeding up rapidly. The earlier larvae pupate in time to produce a partial second brood in August or September, but the later ones hibernate in the pupal cocoon, not changing to pupae until the spring. Pupa rather slender, glossy, yellowish-brown, in a silken cocoon on the ground or among stems of *Galium*. Common in the greater part of Europe and from Asia Minor to the Ili district.

Subgenus *Plemyria* Hbn. Differs from the subgenus *Cidaria* in having the areole undivided. From *Epirrhoë*, which has also a simple areole, in the stronger palpus, more definitely crested metathorax, differently formed abdomen, broader areole, with 1st radial stalked, etc.; also essentially in the early stages.

bicolorata. **C. bicolorata** Hufn. (= *rubiginata* Schiff.) (8h). White, more glossy than in any succeeding species of the group, yet more thinly-scaled than *ocellata*. Forewing with brown basal patch and anterior half of median band, both wings with more or less well-defined bluish-smoky distal border. — ab. **parvula** Retz. has in addition a dark spot at the middle of the hindmargin of the forewing. — In ab. **guttata** Huene the median band is reduced to a mere spot surrounding the discal dot. — **plumbata** Curt. (= *completa* Rbl.) is a race which inhabits Scotland and the North of England. The median band is uninterrupted, or only very narrowly interrupted and the smoky dark bordering is usually intensified. Sometimes also there are traces of a narrow *fumosa*. smoky band midway between the basal and median patches. — ab. **fumosa** Prout (= *plumbata* Newm., Stgr. nec Curt.) is an extreme aberration, not infrequent among the race *plumbata*, in which the ground-colour of the forewing is in part or wholly suffused with smoke-colour, sometimes so deeply as almost entirely to obliterate the markings. Hindwing also sometimes infuscated. — **maritima** Strand is given as a Norwegian race, smaller than the type, with the marginal band of the forewing black-grey, not or scarcely interrupted, etc. — *dahurica*. **dahurica** Stgr. from Dauria, Japan and possibly Roumania, is yellowish white, with the basal and costal patches light brown, the dark borders weak. — Larva very slender, elongate, smooth; head rather flattened, green; prothorax somewhat projecting to points over head; body green, blue-green dorsally, subdorsal line yellow, segment-incisions pale; two well-developed whitish anal points. April or May to June on alder and blackthorn, or allied plants. Pupa uniform bright green, anal point tinged with red-brown; spun among leaves by a few threads and very active. The moth flies in July and August. Central and Northern Europe, Siberia and according to STAUDINGER Japan.

Subgenus *Thera* Steph. (= *Corythea* Dup.). Differs from *Cidaria* in having the discocellulars of the hindwing strongly biangulate. ♂ antenna sometimes with slender pectinations. In *serraria* the areole is usually single. Probably not separable from *Dysstroma*, but the larva is stouter and specialized to Coniferae.

A. ♂ antenna shortly ciliated.

variata. **C. variata** Schiff. (8h). Forewing clear grey, greenish-grey or brownish-grey, never clear brown or fulvous, median band with its proximal edge moderately angled, its distal edge deeply indented on the veins; pale subterminal line generally rendered distinct by dark shading, likewise strongly dentate. Hindwing rather variable in colour, whitish-grey to darker grey, with a distinct dark discal dot and often a distinct postmedian line. A variable species, both in size and colour, in the extent of the median band and the degree to which this is darkened. — In ab. **nigrofasciata** Gmpbg. (= *medionigricans* Reutt.) the ground-colour is grey-white or pale wood-colour, while the band is decidedly darkened. — ab. **stragulata** Hbn. (= ? *vetustata* Schiff. = *vitiosata* Frr. = *resinaria* Peyer.) (8h) is an interesting modification of *nigrofasciata*, with the band reduced to a costal blotch as in *C. bicolorata*, sometimes followed, as in our figure, by minute vestiges of the posterior part of the band. — *cembrae*. **cembrae** Kitt is possibly a synonym of *nigrofasciata*, but KITT describes the ground-colour as "pure grey, without brownish admixture", and says that it is a mountain form, occurring near the tree-limit (1800—1900 m.) and found only among *Pinus cembra*, on which it probably feeds. Austria and Germany. — The larva has scarcely been differentiated from that of the following species, but feeds chiefly on *Abies excelsa* and *pectinata*, *Picea excelsa*, etc., rarely (perhaps never in a wild state) on *Pinus sylvestris*. It is apparently on the whole rather more weakly-marked than that of *obeliscata*, but variable; HÜBNER is in error in figuring it with a red head. It hibernates and feeds up in the spring. Pupa very like that of *obeliscata*. The moth appears in May and June, in some localities rather earlier than *obeliscata*, and there seems to be a very partial second brood later in the summer. It inhabits pine-forests in Central and Northern Europe, a few more southerly localities, the mountains of Central Asia and China, E. Siberia and Japan.

C. obeliscata *Hbn.* (8h). ♂ with the group of spines on the aedeagus differing from that of *variata* ♂. *obeliscata*. Forewing reddish brown or fulvous, the distal edge of the median band not strongly indented, or with only one deep indentation (on the fold); pale subterminal line commonly obsolete, or if present, not strongly dentate. Hindwing rather more glossy and brownish than that of *variata*, the discal dot generally altogether obsolete on the upperside, though expressed beneath. — ab. **tristrigaria** *Donov.* is an infrequent aberration with *tristrigaria*. 3 unusually well developed, elongate interneural submarginal streaks between the 5th subcostal and 3rd radial veins. — ab. **mediolucens** *Rössl.* is a rather striking form in which the ground-colour is appreciably darkened *mediolucens*, while the median band remains fulvous, thus appearing lighter, or at least brighter, than the adjoining areas. — ab. **obliterata** *B. White* (= *scotica* *Stgr.*) (8h, as *scotica*) is almost unicolorous brown-black or black-brown. *obliterata*. Britain and occasionally in the mountains of Central Italy. — Larva of moderate thickness, nearly cylindrical, tapering towards the anal end, which bears 2 minute, well separated points; head green, mouth-parts red; legs red; claspers green; body green, in longitudinal stripes, assimilating well to pine-needles; subdorsal, lateral and ventral lines yellow. Feeds chiefly on *Pinus sylvestris*. It hibernates and is full fed in May and there is a partial second brood later in the summer. Pupa rather slender, olive-green, dorsally and ventrally with several yellow or whitish longitudinal lines, anal point red; spun by a few threads among pine-needles; very active. The moth inhabits pine-woods, or even very small plantations. Abundant in many parts of Northern and Central Europe, also recorded from Castile and Transcaucasia.

C. variolata *Stgr.* (8h) from Algeria, scarcely seems to differ except in its smaller size and in that *variolata*. the central band is generally straighter-edged proximally; hindwing perhaps more weakly marked. *STAUDINGER* thinks the palpus is shorter and the antennal ciliation more minute; the former observation is perhaps correct the ciliation does not differ.

C. exangulata *Warr.* (8l). Shape of *variata* or with the distal margin of the forewing slightly more *exangulata*. oblique. Easily known by the shape and position of the dark median band. Forewing beneath marked more weakly than above, hindwing more strongly, showing a conspicuous discal dot. Inhabits the mountains of Kashmir in June.

C. expiata *Püng.* is possibly also related to *variata* but the forewing is more acute, the distal margin *expiata*. straight, not curved, the ground-colour even lighter than in ab. *nigrofasciata* and ab. *stragulata*, white with only a slight yellow-brown tinge, the basal and central areas narrow, little darkened except at their edges (especially at costa), the latter area dark-marked on the 2nd median and the submedian veins. No dark apical dash. Distal area, hindwing and under surface quite weakly marked, both wings with small discal dot above and beneath. ♂ antenna minutely ciliated. Turkestan: Aksu.

C. cognata *Thnb.* (= *simulata* *Hbn.*, *coniferata* *Curt.*) (8i) is easily distinguished from *variata* by its *cognata*. strong purple-brown or red-brown gloss. Hindwing a little more glossy than in *obeliscata*. A very local species, belonging almost exclusively to the North of Europe and to the Alps and Pyrenees. The typical northern form is rather small and in general dark reddish. — **geneata** *Feisth.*, the prevailing form in the *geneata*. Alps and in Transcaucasia, perhaps also in the Pyrenees, is larger, somewhat paler and with a less definite red tinge, the ground-colour being somewhat mixed with violet or purplish. — ab. **perversa** *Hirschke* is an *perversa*. aberration of *geneata*, from the Franzenshöhe, in which the basal and median areas of the forewing, instead of being darker than the ground colour of the wings, are lighter. — The egg hibernates. Larva stout, smooth, head rounded, rather large, brown, body green with bluish dorsal stripe and white subdorsal and lateral stripes, the latter often edged above with dark red; legs red; claspers green; anal points minute. It feeds on juniper from April to June. Pupa dark green, with spiracles and cremaster brown. Imago in July and August.

C. postalbida *Wileman* is somewhat larger and broader-winged than most of the group (about as a *postalbida*. large *firmata*), the ground-colour of the forewing reddish brown, about as in *cognata*, the basal and median areas more fuscous, bounded by fine whitish lines; basal patch almost rectangularly edged, the angle, as usual, in the cell; median band rather variable in width, its proximal edge arising at beyond one-third of costal margin, angled on median vein near end of cell, then forming a single curve, reaching the hindmargin at about two-thirds; discal mark black, somewhat elongate; postmedian line from nearly two-thirds costa, forming a blunt projection about the 2nd and 3rd radials, then retracted and reaching hindmargin scarcely 2 mm from antemedian; a black dot on hindmargin at end of basal patch, closely followed by a black line which extends along the margin as far as the antemedian; subterminal line bluish white; anterior veins blackened between subterminal and termen, accompanied by some scattered bluish-white scales. Hindwing dirty white, with dark grey discal dot. Forewing beneath very feebly marked, hindwing with the discal dot blacker. Japan: Hakodate to Yamato, April—May, July and October—November. I have also a ♀ from Wenchow, kindly presented by Mr. C. T. BOWRING.

guriata. **C. guriata** Emich (13 e) is also a moderately broad-winged species. Size of *variata*, with which EMICH compares it. Forewing brownish grey, in the basal and median areas and at the distal margin mixed with blue-grey, the lines dark brown; subbasal dentate inwards on the veins; antemedian line dentate, from before one-third of costa to just before one-half hindmargin; a less distinct line follows it; cell-spot large, conspicuous; median area rather broad anteriorly, the postmedian, which is lunulate-dentate and arises at beyond two-thirds costa, being bent inwards at the 2nd median and the fold, and only slightly outwards behind; a less distinct line precedes the postmedian; a narrow whitish shade follows it; subterminal line conspicuous, deeply lunulate-dentate, strongly brown-shaded on each side; large dark spots on distal margin; fringe intersected by a dark line and dark-spotted at the vein-ends. Hindwing unicolorous fuscous; fringe as on forewing. Forewing beneath glossy dark brown, anteriorly broadly pale distally to the postmedian and with a pale costal mark at beginning of subterminal. Hindwing more grey-dusted than above, with dark cell-dot and pale, angled postmedian line. Transcaucasia.

dilectaria. **C. dilectaria** B.-Haas is said to be similar to *guriata*, which is distinguishable at once by the much sharper, more distinct and regular markings, sharply expressed discal dots and more varied underside. In *dilectaria* both wings above are blackish blue-grey with leaden gloss, the markings of the forewing extremely weakly indicated by irregular grey, black-mixed lines, only the dentate grey subterminal line more distinct; a light costal mark adjoins the distal boundary of the median band. Hindwing unicolorous, or with faint traces of greyer markings at the anal angle. Underside unicolorous black-grey, only mixed with yellowish at the costal margin of the forewing. Founded on a single very fresh ♂ from the Juldus district.

callidaria. **C. callidaria** Joan. Forewing pale reddish grey, traversed by 5 strong, unequal, sinuous lines; the first, which is arcuate, is placed at 1 mm from the base; it limits a space a little darker than that which succeeds. The third line, nearly of the same strength as the first, borders this paler area, in which stands the second line, very little marked. The fourth line, the strongest of all, is more sinuous than the third and bounds an area of the same tint as the base of the wing, containing a black dot. The rest of the wing reassumes the colour of the second interval; it contains the fifth line, which is pronounced towards the distal margin, weaker at its extremity. A little black line parts from this line near the costa and runs into the apex. The fringe is chequered, the pale intervals being the broadest. Hindwing uniform reddish grey. Beyrout (Syria), 1 ♂

juniperata. **C. juniperata** L. (8 i). Paler (usually much paler) than *cognata*, the distal edge of the median band even more jagged than in *variata*, from which it further differs in its delicate fawn-coloured tinge, absence of dentate subterminal shading, longer black apical streak, etc. — ab. **divisa** Strand (= kardakovi Krulik.) has the median band broken into two or more parts, being interrupted, at least on the fold, by the ground-colour. A common but unimportant form; in LINNÉ's type-specimen the band is very nearly broken at this point. —

scotica. **scotica** B. White is a rather smaller, darker-marked race from Scotland. — Larva of moderate thickness, anus with two small projecting points; head green, tinged with brownish; body smooth, bright green, somewhat more bluish dorsally; several ill-defined darker and paler green longitudinal lines. On juniper. Pupa slender, rather glossy, grey-brown or pale green. The moth is said to appear sparingly in May-June; but the second generation, which emerges from September to November, according to the locality, is very much the more abundant. In Scotland there is a single generation, July-August. Northern and Central Europe and parts of Italy.

cupressata. **C. cupressata** Hbn.-Geyer (= cupestrata Frr.) (8 i). Nearest to *juniperata*, but distinguished at once by the conspicuous black markings at hindmargin and distally between the radials, etc. Larva rather stout, green, with interrupted white subdorsal lines which form a sort of lozenge-shaped pattern. On Cupressus and Juniperus sabinus. Pupa slender, light green with the cremaster red. The moth appears in the autumn and again in April, and is suspected of hibernating. Very local, S. France to Austria and in the Brusa district.

tabulata. **C. tabulata** Püng., from Koko-Nor, is very similar to *cupressata*; median band anteriorly broader, filled with red-brown, posteriorly narrower, white edged, distally less undulate; apical line weaker, anterior radial streak thick, posterior wanting; marginal line less broken into pairs of dots; hindwing and underside lighter. Palpus rather weaker, antennal shaft rather more slender.

fedtschenkoi. **C. fedtschenkoi** Ersch. perhaps belongs to this subgenus, as the author compares it with *cognata* and proposes to place it in LEDERER's section I. A. b.; but it was founded on a single ♀. "Grey, the forewing with a fuscous basal line, a central band limited on each side by a fuscous line and including a black central dot and a very indistinct fuscescent posterior striga, the cilia somewhat chequered with fuscous." The figure (apparently not very good) shows a narrow-winged, fawn-coloured species with darker median band (on the hindwing ill-defined proximally), the blackish antemedian and postmedian lines of the forewing dentate but nearly parallel. Near Isfāira (Ferghana) in May.

C. praefecta *sp. nov.* Much larger than *variata* (43 mm., length of a forewing 20 mm), the coloration of the forewing more as in a rather washed-out *corylata*, the basal and median bands being fuscous (but mixed with whitish), the intermediate and distal areas greenish, by reason of an admixture of yellow and fuscous scales; median area shaped nearly as in some *corylata*, almost interrupted at the fold, but with the section between the fold and the submedian vein angularly produced both proximally and distally; the dark lines which bound the median area somewhat thickened and blackened at hindmargin; subterminal line less strongly dentate than in *variata*. Hindwing dirty whitish, weakly marked, the postmedian line (which is only distinct beneath) shaped nearly as in *corylata*. Forewing beneath also pale, slightly more yellowish, anterior half of postmedian line well expressed. Nikko, type (♀) in coll. PÜNGELER; Yokohama, cotype (♀) in coll. Brit. Mus. The ♂ will perhaps prove to have pectinate antenna as in *comis*, in which case *praefecta* must be removed to section B.

B. ♂ antenna bipectinate.

C. firmata *Hbn.* (= *consobrinata* *Curt.*) (81) is sometimes, though quite unnecessarily, confused with the brightest reddish forms of *obeliscata*. Apart from the pectinate ♂ antenna (2 pairs of rather short, slender pectinations to each segment) the paler, more yellowish-tinged hindwing, pale abdomen with red-brown dorsal line, dark subbasal mark along the hindmargin, more deeply angulated antemedian line, more bluish white (or violet-white) subterminal line, usually accompanied by some slight violet-grey shading, and absence of black apical dash all distinguish it. The typical form, which varies very little, inhabits Northern Central Europe, Switzerland and Austria-Hungary. — **ulicata** *Rbr.*, from S. France, Castile and Lower Austria, has the ground-colour predominantly of the pale violet-grey or blue-grey tone and the median band darkened. — The egg hibernates. The larva hatches in the spring but generally feeds up extremely slowly and is sometimes not full-fed till the beginning of September. It is easily distinguished from the similar larvae of *variata* and *obeliscata* by its red head. On *Pinus sylvestris*. The moth begins to appear in July or perhaps already in June, but the principal emergence is in August–September.

C. comis *Btlr.* (13e) shows the antennal structure of *firmata* but the coloration and superficial appearance of *variata*. From the latter, however, it may be at once distinguished by the rather less strong and differently placed distal projection of the median band; this forms a more rounded, even, double lobe, projecting before and behind the 3rd radial. There is a dark blotch (usually conspicuous) on the posterior margin of the forewing between the basal patch and the central band. Japan: Oiwake, in October.

C. consimilis *Warr.* also agrees with *firmata* in structure and with *variata* in coloration. The projection in the median band is about as strong and irregular as in *variata*, but perhaps slightly more posteriorly placed; the veins are more or less blackened, especially the 1st radial of the forewing in the distal area, thus recalling also *cupressata*; in this and in the absence of a developed dark blotch on the hindmargin between the basal patch and the median band it differs from the otherwise similar *comis*. N. W. India and Afghanistan.

C. dentifascia *Hmps.* (13e) is of a browner colour than the preceding, with darker median band on the forewing both above and beneath, whiter, more clearly-marked hindwing, bearing a more angulated line and sharper black discal dot, veins of the forewing not blackened, under surface rather recalling that of *citrata*. N. W. Himalayas.

C. serraria *Z.* (= *lienigiaria* *Led.*, *ziczaccata* *Schöy.*) (8i) probably belongs in this vicinity. It is anomalous in having the areole usually single, but as it is sometimes double (at least in the ♀) it is not necessary to establish a separate section for it. Although variable, it is unmistakable on account of the strongly zigzag markings. In the typical form, which we figure, the central band is completely broken at the 2nd median vein, sometimes also at the 2nd submedian. — In ab. **continua** *Strand* the band is uninterrupted. — ab. **albida** *Stichel* has the median area almost entirely filled up with white, leaving only quite narrow brown edges and the black cell-spot. — In ab. **spania** *Stichel* the band is developed in its anterior half only (as in *variata* ab. *stragulata*), one or two small brown spots near the hindmargin alone remaining of its posterior part. — I know nothing of the larva; there is a brief note in Russian by BLÖCKER in the *Rev. Russe d'Ent.* vol. 4, p. 212, but no translation is given. *serraria* is scarce and local in Scandinavia, N. Russia and N. E. Siberia, chiefly at high latitudes. — **serrataria** *subsp. nov.* is rather broader-winged, the apices thus appearing rounder; forewing with basal patch more obliquely edged, thus fully as broad at hindmargin as at costa, the white bands which bound the median area narrow, the subterminal lunules not quite so deep, thus not so closely approaching the distal margin, the distal area not so uniformly darkened, the fringe less sharply chequered; hindwing above unmarked, or with only a weak dark spot close to anal angle. Underside more weakly marked than in *serraria*, the postmedian line of the hindwing fine, rather weak, placed rather further from the distal margin and projecting 2 extremely long teeth basewards, one on each fold. Kasakewitsch, Ussuri district (M. Korb) type (♂) and ♀ in coll. R. PÜNGELER. Probably a good species.

phaiosata. **C. phaiosata** Stgr. (8 l). According to STAUDINGER the genitalia of the ♂ (which I cannot compare) show that it belongs to the present group; otherwise I should have inclined to refer it to the neighbourhood of *pendearia* Ob. (subgenus *Calostigia*). I believe our specimen is correctly determined. ♂ antenna with longish, well separated pectinations (only one pair to each joint?). Forewing grey-brownish, the markings formed of wavy dark lines, the median band being only indicated by two or three proximal and two or three distal ones; subterminal line sometimes accompanied by some thick black wedge-shaped marks. Forewing beneath with discal dot and postmedian line; hindwing here with the postmedian row of dots more distinct and the basal half of the fringe darkened. Koko-Nor.

Subgenus *Chloroclysta* Hbn. Differs from *Cidaria* in the long palpus and in the larva.

siterata. **C. siterata** Hufn. (= *psittacata* Hbn., *viridifasciata* Goeze, *rubroviridata* Don.) (8 i). This species and the following differ from all the rest of the group in their green colouring and in their hibernating stage. *siterata* is variable, but is distinguished by its dark hindwing and nearly always by having some admixture of red in the forewing. The green colour is also deeper than that of *miata* and a costal or subcostal spot distally to the median band generally purer white. Distributed through most of Europe, Asia Minor and Transcaucasia. Larva very long and slender, the thorax slightly less thin, the anal points well developed; green, the thorax with a red dorsal line, abdomen with a red dorsal spot on each segment; legs and anal points tipped with red. On various trees, June-August. Pupa slender, yellow-brown with a delicate purple bloom, dotted with black; cremaster darker. The moth appears towards the end of August and hibernates.

miata. **C. miata** L. (= *coraciata* Hbn., *viridulata* Zett.) (8 i). Forewing green, easily fading to a dirty yellowish, hindwing dirty white, dusted with green, especially in its distal part. Not very variable. The larva is similar to that of *siterata* but perhaps even more slender and more perfectly cylindrical and usually with the most conspicuous red (or red-brown) markings ventral, not dorsal. On various trees. Pupa slender, light brown with a delicate purple bloom. In a very slight cocoon on the ground. The times of appearance and the geographical distribution nearly agree with those of *siterata*, but *miata* is perhaps wanting in Spain and Asia Minor, while on the other hand it occurs in Corsica, N. Italy and the Ala Tau district.

Subgenus *Dysstroma* Hbn. (= *Polyphasia* Steph.). Essential characters of *Thera*, average size larger median area usually broader, ♂ antenna not bipectinate, larva more slender, not attached to Coniferae.

corussaria. **C. corussaria** Ob. (8 k). A pretty species and, so far as I know, not very variable. The shape of the median band distinguishes it at once from the other species, even in the rare cases when they approach it in coloration. Hindwing in strongly marked specimens with a distinct, bluntly angled postmedian line. Under surface similar to that of *truncata*, except that the postmedian line of the forewing follows almost the same course as above and that the cell-spots are smaller. S. E. Siberia and Japan.

latefasciata. **C. latefasciata** Stgr. Near *truncata*, on an average a little larger, more smoothly scaled, the median area similarly shaped, on an average broad, but variable, its colour whitish, sometimes more or less dusted with blackish-grey or brownish. The most characteristic features are a rather large white spot on the hindmargin of the forewing between the basal area and antemedian line, the absence of distinct red-brown subbasal shading, and a very strong blackish clouding in the distal area obscuring the middle of the subterminal line and meeting the apical streak on the one hand and the dark-clouded anterior distal part of the median area on the other. Discal dot rather large, often merged in the line which follows it. Hindwing uniformly grey, or slightly darkening distally, sometimes showing feebly the pale spots which become so distinct in *concinna*. Fringe distinctly dark-spotted. Beneath marked more like *citrata*, hindwing rather darker. BLÖCKER claims that this is a good species and takes it in old fir-woods near St. Petersburg at the time when *truncata* is getting worn and *citrata* beginning to appear — end of July and first half of August. Commoner in the mountain districts of Siberia.

planifasciata. **C. planifasciata** spec. nov. (13 e). Median area shaped nearly as *citrata* but broader. Wings more glossy. Forewing with subbasal and antemedian lines less angulated but more oblique, clearly defined, with brownish shade between them; median area white, sometimes with a delicate tinge of brown; a slender dark band distally to the antemedian and a broad costal half-band proximally to the postmedian; discal dot about as in *citrata*; distal area on an average less strongly marked than in *truncata* and *citrata*. Hindwing grey or whitish-grey, very weakly marked. Fringes weakly or scarcely dark-spotted. Under surface nearly as in *citrata*, the postmedian line of the hindwing on an average placed rather further distad, not (as in many *citrata*) indented before the 2nd radial. Kashmir: Koksar, etc., July-September. Type ♂ and a ♀ in my collection, another pair in that of the British Museum.

C. cinereata Moore (7k) is as glossy as the preceding species and has the median area almost as *cinereata*. broad, but I do not think it can be a form of it. The postmedian line of the forewing is *incurved* behind the 2nd median vein, and a very characteristic marking stands on the hindmargin, namely a long, erect dark fuscous spot reaching from close to the anal angle almost or quite to the 2nd median. Hindwing dirty whitish, almost unmarked. Hindwing beneath with discal dot, but the postmedian line almost obsolete, apparently less angulated than in *planifasciata*. In the name-type the median area is white, dusted with grey from the costal half-band to the posterior margin. — In ab. **flavifusa** Warr. the median area (except the blackish costal half-band) is yellowish. — *cinereata* belongs chiefly to Bengal and Sikkim, but has also occurred at Mou-pin, on the confines of the Palearctic Region. *flavifusa*.

C. volutata (Püng. M. S.) *sp. nov.* comes still closer to broad-banded *truncata*, the forewing being without *volutata*. gloss and having the median area densely irrorated with dark scales. The forewing is rather rounded; the pale ground-colour shows a slight tinge of yellowish which, blending with the dark grey scales, gives to the wing a somewhat olivaceous tone, a little recalling *truncata* from the high North; brown bands obsolete; basal area rather well defined, its edge not angulated on the folds; a narrow, slightly darkened band occupies the proximal part of the median area, as in some *citrata*, and touches a dark (on both sides white-edged) spot nearer the base on the inner margin; the lines which bound the narrow band are dentate, but are not angled; postmedian line nearly as in the least dentate, most rounded-lobed *truncata*, or as in *cinereata*; subterminal line not interrupted, not sharply dentate anteriorly; discal dot slightly elongate but not thickened. *Hindwing white*. Under surface nearly as in *truncata*, postmedian line of hindwing without deep indentation on the radial fold. Koko-Nor, type (♂) in coll. PÜNGELER. Figured in Iris vol. 21, pl. 4, fig. 18 as "*truncata* var.?"

C. truncata Hufn. (= *saturata* Steph.) (8k). Very variable, especially in the median area of the forewing, but generally recognizable by the blurred basal area, large discal dot, the teeth in the postmedian line near the costa, absence of very long or very acute projections in this line before and behind the 3rd radial, uninterrupted (or almost uninterrupted) white subterminal line and the grey (not white) hindwing, often with indications of white subterminal spots. On the underside of the hindwing the dark postmedian line is usually well expressed, more or less dentate (or at least indented before the 2nd radial) and rounded or only bluntly angled at the 3rd radial. In the name-type the median area is dusted with grey. — ab. **centumnotata** Schulze (8k) has the central part of the median area white, free from grey dusting. — ab. **perfuscata** Haw. (? = *russata* Schiff.) (8k) has the median area black. — In ab. **rufescens** Ström (= *commanotata* Haw., *mediorufaria* Fuchs, *ochreata* Schille) the same area is reddish or tawny. — ab. **nigerrimata** Fuchs is an almost unicolorous black or dark grey form. I suspect *schneideri* Sandb., said to constitute a local race in some parts of Polar Norway, is the same form, or very similar; in this case SANDBERG'S name should have priority. — Space forbids entering into full details of the variation of this species and *citrata*; I have dealt with them very thoroughly in Trans. City Lond. Ent. Soc. vol. 18, pp. 33—60. Larva rather elongate, roughly cylindrical, smooth, with anal points well developed; green with indistinct paler subdorsal line, often also with red lateral line and red anal points. Polyphagous, though perhaps fallow and some of the Rosaceae may be mentioned as favourite foodplants. Except in the northernmost parts of its range it is regularly double-brooded, one brood hibernating, the other feeding up rather rapidly in June—July or early August. Pupa in a slight cocoon among leaves; rather slender, uniform pale green at first, the wings soon becoming light brownish; cremaster reddish. The moth appears after 2 or 3 weeks and is abundant in May—June and again in August—September. Central and Northern Europe and eastward to the Ural. Other records belong to *citrata* or need confirmation. In the extreme north of Europe also it generally gives place to *citrata*. *truncata*. *centum-notata*. *perfuscata*. *rufescens*. *nigerrimata*.

C. concinnata Steph. (= *boreata* Curt., *consolidata* Gregs.) (8k). This very interesting insect has been proved by the ♂ genitalia to be a good species. The spines on the aedeagus are intermediate in their development between those of *truncata* and *citrata*, or rather nearer to the latter. Generally easy to recognize by the mixture of white and fuscous in the central area, arranged in very irregular spots, patches or broken bands; the discal dot is large, as in *truncata*, the postmedian line projects almost or quite as sharply as in *citrata*, but the hindwing is at least as dark as in *truncata*, sometimes darker, and shows a very conspicuous row of white subterminal spots. The postmedian line on the hindwing beneath makes two deep angles base-ward, one near the costa, the other before the 2nd radial; the outward angle on the 3rd radial is sometimes nearly as pronounced as in some forms of *citrata*. Variable. Flies only among heather on high-lying ground, chiefly in the Island of Arran, though one or two examples have been recorded from the Western Mainland of Scotland; July and part of August. *concinnata*.

C. citrata L. is far more variable even than *truncata*. It is generally distinguishable, to the practised eye, by its slightly narrower, more pointed forewing, resulting in a slightly different resting-posture which rather recalls that of a Deltoid moth. The reddish subbasal and outer bands are usually much more sharply *citrata*.

defined than in *truncata*; the postmedian line of the forewing commonly lacks the subcostal teeth, but nearly always projects more sharply at the 3rd radial; the subterminal line is nearly always interrupted in the middle; the discal dot is usually small or very small; the hindwing whitish, its postmedian line generally (though not always) *acutely* angled outwards at the 3rd radial and rarely much indented before the 2nd radial. In addition, the forewing generally shows a much more sharply white costal patch, just beyond the postmedian line and altogether *immanata* is a more sharply marked species. In the name-type, so far as LINNÉ's description shows, the median band is greyish, thus intermediate between our two figures. — ab. **punctumnotata** Haw. (= *passeraria* Frr.) (8k) has the central area clear white, usually purer than in the corresponding form of *truncata*. — ab. **immanata** Haw. (= *amaenata* Steph.) (8k) shows the opposite extreme, the median area being black-simpliciata. often of a more glossy black than in *truncata* ab. *perfuscata*. — ab. **simpliciata** Walk. (= *tysfjordensis* Strand) thingvallata. has white or grey spots in the middle of the otherwise black median area. — ab. **thingvallata** Stgr. is a very beautiful form, occurring chiefly in Iceland, in which the median area is black or very dark, the basal and krassnojar-scensis. distal areas white, almost entirely without markings. — **krassnojarscensis** Fuchs, from Southern Siberia, was described from a single specimen; forewing narrow, nearly uniform whitish, with the transverse lines sharply acutata. marked. — **acutata** Guen., said to be a constant form in the neighbourhood of Besançon, is also narrow-winged, the forewing with the apex more acutely produced, the distal projection in the median band also more than usually prolonged. — **pythonissata** Mill. (8i) is an interesting race from the Shetland Islands, very variable pythonis-sata but always recognizable by the white spots in the median area (at least about the discal dot), the sharply white lines and the very sharply marked underside, with a prevailing brownish tinge. — The egg hibernates. Larva very similar to that of *truncata*, more perfectly cylindrical, anal points more blunt, colour yellowish or very pale green, very rarely with red lateral line. On various low plants, probably with a preference for *Vaccinium*. Full-fed about June. Pupa closely similar to that of *truncata*. Imago in July and August, often extraordinarily abundant where it occurs and thriving best in northern latitudes (Iceland, Norway, Scotland). It has an exceedingly wide range, occurring almost throughout Northern and Central Europe, Northern and Central Asia and the northern parts of North America.

infuscata. **C. infuscata** Tgstr., described as a variety of *truncata*, is, according to BLÖCKER, another distinct species. I have no personal knowledge of it and as BLÖCKER's article on the subject is written in Russian I can only quote TENGSTRÖM's diagnosis: "Forewing with the apex rounded, the distal area ashy-bluish, nearly without markings, hindwing infuscated". Finland. It is just possible that *schneideri* Sandb. represents the same form (or species), as BLÖCKER suggests.

brunneata. **C. brunneata** Pack. (= *suspectata* Möschl.) is unknown to me but is much smaller than *truncata*, the dark median band differently shaped, narrower posteriorly, preceded and followed by brown bands, and seems clearly to be a distinct species. Labrador. Recorded also from Belgium, no doubt in error.

Subgenus *Xanthorhoë* Hbn. (= *Ochyria* Warr. nec Hbn. = *Orthonama* Hbn.). Face usually with projecting cone of scales. Antenna in ♂ pectinate or prominently dentate. Forewing with areole double. Hindwing with discocellulars not biangulate.

A. Antennal pectinations fully developed, one pair to each segment (*Xanthorhoë*).

munitata. **C. munitata** Hbn. (= *fulvata* F. nec Forst., *decoloraria* Esp., *arcticaria* Germ., *collinaria* Metzner) (8l). Very variable, especially in Iceland, but the forms intergrade so completely that it seems unnecessary to impose names on any but the most extreme aberrations. The ground-colour varies from clear white to smoky grey, sometimes slightly brownish; the median band varies much in width and somewhat in shape; in colour it is usually pale dull reddish, sometimes darker reddish, sometimes grey or even blackish brown. — *algidata*. ab. **algidata** (Möschl.?) Stgr. has the median band almost obsolete, being chiefly indicated by the principal lines which traverse it. It occurs in Iceland, but is said to be a common form, perhaps a local race, in Labrador. On the other hand MÖSCHLER says that his *algidata* cannot be confounded with any known species and the *infuscata*. ZELLER collection contained under this name a moth more like the Canadian *fossaria* Tayl. — ab. **infuscata** ab. nov. Forewing much infuscated, dirty grey-brown with slight tinge of yellow, the median band weakly *hethlandica*. expressed, more reddish; hindwing dark smoke-coloured. Iceland, in my collection. — **hethlandica** Prout is a race from the Shetland and Orkney Islands with the ground-colour of the forewing strongly yellow ochreous. Similar, though less extreme examples occur occasionally among the other forms in Scotland and Iceland. — *labradorensis*. **labradorensis** Pack. has the ground-colour more grey, the band darker, more brown (not red). Labrador. — *strigata*. ab. **strigata** Pack. seems to be merely an extreme development of *labradorensis*, with the band black. — *pauperrimata*. **pauperrimata** Chr., which I have not seen, is perhaps somewhat similar to *hethlandica*. The ground-colour is pale ochreous, the median band uniformly reddish fuscous. Caucasus and the Issyk-kul and Ili district. — The larva hibernates; it is stout, tapering at the extremities, sides rugose and slightly carinated; head small, ochreous; body usually green, shaded with pink at the incisions, an interrupted dark dorsal line, a very faint brownish subdorsal and a broad whitish lateral stripe. It feeds on *Alchemilla* and other low plants and is

full-fed about May. Pupa glossy brown, with paler incisions; in a slight cocoon among moss or on the ground. The moth flies in July and August and inhabits damp places in Northern Europe, Siberia and the north of North America; further south (as from Switzerland to Austro-Hungary) it seems to occur chiefly, if not exclusively, in the mountains.

C. hortensiaria Graes. (= hortulanaria Graes. nec Stgr.) (81, as dimidiaria) has the proximal edge of the median band straight, while in *munitata* it is almost invariably more or less curved; the band itself traversed by dark lines, the distal area and the hindwing usually more darkened. Japan and the Ussuri district. *hortensiaria*.

C. inconsiderata Stgr. The wings in the ♂ are rather narrow for a *Xanthorhoë* and the abdomen long and slender; the ♀ is more normally shaped. Rather larger than *fluctuata*. Wings light white-grey (dirty white), the markings of the forewing brown-grey with an olivaceous tinge; basal patch not sharply defined distally, median band twice as broad anteriorly as posteriorly, enclosing around the dark cell-dot an ill-defined paler patch which sometimes reaches the costal margin, the band being then forked; distal area weakly marked, much as in *fluctuata*, but with the costal spot weaker, grey, distal margin with pairs of black dots; fringe white, very weakly chequered. Hindwing whitish, with traces of dark postmedian line or band and sometimes with rather broad dark distal band. Underside of forewing white-grey, of hindwing whitish; dark postmedian line or band and distal band indicated. ♂ antennal pectinations shorter than in *salicata*. A ♀ before me has the markings of the forewing darker, the basal area well defined, the hindwing mostly grey, though traversed by ill-defined white lines, only the divided postmedian band conspicuously white. Amasia. *inconsiderata*.

C. fluctuata L. (= fibulata Hufn., cinerata Geoff.) (9 a). Antennal structure in the ♂ intermediate towards that of section B, the pectinations being short and strongly ciliated, while each joint bears also a shorter process from which grows a fascicle of cilia. One of our best-known European Larentiids and generally easy to recognize, in spite of its variability. In the typical form the ground-colour is dirty whitish and the median band is almost or altogether obsolete in its posterior half. — ab. *ochreata* Prout (= ochracea Culot) has the ground-colour ochreous. — In ab. *neapolisata* Mill. the ground-colour is much darkened with brown-grey. — ab. *costovata* Haw. (= rimata Now., semifasciata Huene) has the median band much narrowed and somewhat shortened. *deleta* Ckll. is merely a rather extreme development of this and need not be separated. — ab. *immaculata* Tutt is a much rarer aberration with the median band entirely wanting. — ab. *abstersata* H.-Sch. (= incanata Reuter, fasciata Tutt) shows the opposite extreme of development of the band, which is here darkened completely across the wing; distal area also sometimes darkened. — *thules* Prout is a dark race from the Shetland Islands. The less extreme forms intergrade into ab. *neapolisata*, but the name strictly applies to specimens in which both the fore- and the hindwing are entirely infuscated so that the markings are almost obliterated. — *sempionaria* Rätzer is a small race from the Simplon, of a rather purer white than the type and with the median half-band rather small but rather sharply marked. — Larva moderately stout, tapering anteriorly; variable in colour, usually brown, sometimes green; ventral surface paler; dorsum with a row of pale spots which become larger and connected on the last few segments; in each spot a blackish or reddish dot, becoming on the anal segments a continuous line. On various Cruciferae. Pupa glossy yellowish brown with the segment-incisions yellower. The hibernating habit is somewhat variable; often, like *ocellata*, the larva passes the winter unchanged in the pupal cocoon. The moth is double- or triple-brooded; it is abundant in the greater part of Europe and is also found in N. Africa, Asia Minor, Syria and the mountains of Central Asia. *fluctuata*. *ochreata*. *neapolisata*. *costovata*. *immaculata*. *abstersata*. *thules*. *sempionaria*.

C. acutangulata Chr. (= putridaria part. H.-Sch.). This species has been erroneously sunk to the preceding. According to PETERSEN (Lep. Estl. p. 126) the ♂ genitalia are quite different. The ground-colour is nearly or quite white, the basal patch darkest at its distal edge, the median band complete, commonly with a more acute angle distally than in *fluctuata*, somewhat variable in width but not greatly attenuated posteriorly sometimes anteriorly darkened, sometimes enclosing a white patch at its costal end; distal area very weakly marked. Hindwing little darkened distally. Underside dark as far as the postmedian line, pale beyond. Transcaucasia, N. Persia and Transcaspiia. Recalls pale specimens of *fossaria* Tayl. from N. America. *acutangulata*.

C. disjunctaria Lah. (7 f). Closely related to *fluctuata*, the ♂ antennal pectinations slightly better developed. Median band variable in width, but with its posterior part wider in proportion than in the banded forms of *fluctuata*. Sicily and Algeria. — *oxybiata* Mill. has the hindwing dark with sharply defined white band, which is also well expressed on both wings beneath. Cannes, 3 broods in the year, May, July and October. Also recorded from Herzegovina and Morea. — *scoriaria* Trti. from lava-soil in Sicily, is rather small, rather dark-marked; in particular the distal area of both wings (sometimes even the whole hindwing) shows a good deal of darkening. In some examples there is a decided rust-coloured suffusion along the fold of the forewing. — *iberaria* Rbr. (= griphodeata Rbr.) is a darker, more greyish race from Spain. — *pseudogaliata* Stgr. is rather larger, with the median band more brownish. Jerusalem and the Jordan Valley. *disjunctaria*. *oxybiata*. *scoriaria*. *iberaria*. *pseudogaliata*.

- tauaria*. **C. tauaria** Stgr. (9a). This species and the following are distinguished by their very weakly marked almost unicolorous dark wings. Black-brown, the forewing with indistinct, slightly waved antemedian, postmedian and subterminal lines, which, however, are sometimes almost entirely obsolete, or the subterminal broken up into white vein-dots. Underside somewhat lighter brown, markingless. ♀ above also somewhat lighter than the ♂. Antenna in ♂ with moderately long pectinations. Ala Tau and the Northern Thian-Shan. —
- altitudinum*. **altitudinum** Stgr. is a smaller form, unicolorous black-brown, only with some whitish scales in the tips of the fringes. — ALPHÉRAKY considers it a distinct species, with somewhat different habitus. Western Thian-Shan
- alexandria*. **C. alexandria** Stgr. resembles *tauaria* but is mostly much more strongly and somewhat differently marked. Forewing dark smoky brown, the median area usually somewhat darkened, a subbasal lighter band sometimes present; the pale transverse lines vary in distinctness but the postmedian forms a blunt outward projection before the middle (much as in *fluctuata*), which is not the case in *tauaria*; a sharply black discal spot is present; subterminal white line usually distinct, regularly dentate. Underside with black terminal streaks, which are wanting in *tauaria*. Alexander Mountains.
- fidonaria*. **C. fidonaria** Stgr. (9c). Probably related to the two preceding, but very distinct in the bright ochreous coloration both above and beneath. It varies considerably in colour, some examples of both sexes being considerably paler than the one here figured, and there is also a good deal of variation in the strength of the markings. In all forms the extreme distal margin (or at least a limbal line) is darkened, as also the proximal part of the fringes. Ili district.
- praepositaria*. **C. praepositaria** Stgr. (9c as *tianschanica*) somewhat recalls *incursata* but the palpus and antennal pectinations are longer, the wings are a little more elongate, the transverse lines altogether less strong, more grey-brownish, the median area perhaps on an average rather narrower. Both wings, but especially the forewing, bear a distinct black discal dot, which affords a good distinguishing character from the 2 species which follow. The ♀, which I have not seen, is said to be altogether much more sharply marked than the ♂. Margelan and the Alai, etc. (Ferghana). PÜNGELER (in litt.) inclines to refer the species of this group to *Ortholiha* — a weakly defined genus, as has already been remarked.
- tianschanica*. **C. tianschanica** Alph. (9c as *praepositaria*) differs from the preceding in its more brownish, more glossy colouring, still weaker markings, absence of discal dots, etc. Underside with the subterminal represented by a row of whitish dots; costal margin of forewing more ochreous brown. Size typically larger than in our figured example. This description applies to the ♂; the ♀ is much smaller and lighter (more clay-coloured), the markings sometimes almost obliterated. Western Thian-shan. — A greyer race, intermediate towards the following, occurs in Southern Ferghana: it is like the name-type in having a distinct pale subterminal above and beneath and STAUDINGER, who first quoted it as transitional, later referred it without query to *tianschanica*. I propose for it the name of **superpositaria** *nom. nov.*
- superpositaria*. **C. interpositaria** Stgr. (9c) is an inconspicuous species, somewhat intermediate between the two preceding; ALPHÉRAKY considers it merely a form of *tianschanica*. Dirty light grey with the lines more brownish, the median area not darkened except at its boundaries, or occasionally narrowed, by the confluence of these boundaries, into a sort of dark band. The pale subterminal line is usually weak, at least on the hindwing, and is wanting on the uniformly dark grey underside. Ferghana and Issyk-Kul. — **postpositaria** Stgr. from Southern Ferghana, is provisionally referred here as a variety or aberration, distinguished by its more pointed almost unicolorous wings.
- infernaria*. **C. infernaria** B.-Haas is related to *tianschanica* but very different in colour, grey-black, the markings similar, but very indistinct or in part obsolete, discal dot of forewing small, black, of hindwing weaker; terminal line uninterrupted. Underside unicolorous grey-black. Karagaitau, Central-Asia.
- incursata*. **C. incursata** Hbn. (= *disceptaria* Fisch.-Rössl., *decrepitata* Zett., *polygrapharia* Bsd.) (9d). White or greyish white with the markings fuscous. Exceedingly variable, but the general course of the lines can be seen from our figure. The median area of the forewing is never, so far as I know, darkened into a band; the breadth of this area varies greatly. The discal dots are always conspicuous, often rather large. — ab.
- monticolaria*. **monticolaria** H.-Sch. is generally smaller and has the postmedian line scarcely projecting at the 1st median vein. — **sajanaria** (B.-Haas, M. S.) *form. nov.* is rather sharply marked, the median band a little more developed, the pale band beyond it more sharply defined, the basal half of the hindwing greyer; discal dots a little smaller than the average. Sajon, Siberia, in coll. PÜNGELER. — The egg is of a broad oval form and greenish yellow in colour. The larva is somewhat elongate, rather rugose; reddish grey with a black dorsal pattern, consisting on each middle segment of a short and a longer dash followed by 2 fine, obliquely diverging lines; subdorsal,

ventral and subventral lines dark grey, ventral surface otherwise paler; lateral stripe somewhat mixed with white. On *Vaccinium* in the autumn. It usually hibernates nearly full-grown, but will sometimes pupate in late autumn. The pupa is blackish brown with yellow incisions, the anal end thickened. Imago in May and June, inhabiting only the mountains and the high North; the Alps, Germany, Hungary, Arctic Europe and Siberia, Labrador, Baffin Land, the Rocky Mountains, etc.

C. abraxina *Btlr.* (= *pudicata* *Chr.*) (9d) is probably related to the species among which it is here placed but — like several other Eastern Larentiids — has assumed a certain mimetic resemblance to the *Abraxas* group, the body being yellow and the dark distal markings tending to break up into spots. Under surface similar, the median band ill defined proximally. Japan and S. E. Siberia. — ab. **defasciata** *ab. nov.* *defasciata*. from Yesso (LEECH coll.) lacks the median band, only the discal spots here remaining.

C. semenovi *Alph.* (= *ouanguemetaria* *Ob.*, *lugubris* *Stgr.*) (10d) is a species of quite doubtful position, differing from the other *Xanthorhoë* in having the eye rather smaller and the palpus more hairy. Superficially it bears a great resemblance to *lugens* *Ob.* (subgenus *Eulype*) and the eye and palpus suggest that there may, not impossibly, be some real relationship but almost all else in the structure differs and the distal margin of the hindwing is not appreciably crenulate. Forewing beneath mostly white in proximal half, distal half as above; hindwing with postmedian line better developed than above. W. China and Tibet.

C. montanata *Schiff.* (= *implicata* *Vill.*) (9d). Another very variable species. In the typical form the median band is pale-centred and the distal area rather weakly marked. — In ab. **fuscomarginata** *Stgr.* both wings are broadly fuscous-margined, containing a distinct white subterminal line. — In ab. **continuata** *Krulik.* the median band is solid, brown or blackish, not interrupted by any white patch. — In ab. **degenerata** *Prout* (= *constricta* *Strand*) the median area is narrowed and broken into two parts, a larger anterior and a smaller posterior. — ab. **costimaculata** *Rbl.* shows only the anterior half of the band. — ab. **limbaria** *Hbn.* (= *compustaria* *Bsd.*) is a more extreme development, with the band reduced to a very small patch on the discocellulars. In the few examples known to me, as in HÜBNER's figure, the distal area more or less approaches that of ab. *fuscomarginata*. — ab. **unicolor** *Rbl.* has the wings entirely suffused with smoky black, the median band of the forewing faintly indicated. Taken in S. Yorkshire. — In addition to these casual aberrations *montanata* shows a strong tendency to the formation of local races. STAUDINGER considers *fuscomarginata* as such in the Pyrenees, Alps, etc. But in any case the following appear noteworthy: **iberica** *Stgr.* high elevations in the mountains of Castile and Andalusia, with the forewing white-yellowish, with less markings and these less distinct, the median band narrowed and more fuscous. — **lapponica** *Stgr.* from Northern Scandinavia and N. E. Siberia, a smaller, paler form with the markings (except the discal dot) quite weak. — ab. **albicans** *Strand* merely indicates the extreme specimens of *lapponica*, with the markings (except the discal dot) not or scarcely visible. — **shetlandica** *Weir*, from the Shetland Islands, is of the same average size as *lapponica*, but forms a striking contrast to it. It has the forewing much more variegated, the ground-colour suffused with ochreous between the basal and median bands and distally, the median band sharply marked at least at its edges, sometimes pale in the centre, sometimes mixed with bright ochreous brown. — Larva moderately stout, tapering a little at anal end, laterally rugose; head small, blackish, with two ochreous dashes; body ochreous brownish, dorsal line blackish brown, on the middle segments broken by pale lozenge-shaped patches which contain each a short line and some dark dots. Hatches in June or July, feeds on various low plants and hibernates, pupating about April. In captivity it occasionally feeds more rapidly and produces the moth in the autumn. The pupa is moderately slender, shining yellowish red-brown with darker cremaster; the shape is about as in the rest of the genus and the anal armature similar, consisting of a pair of approximated spines with curved tips and some short hooked bristles. The moth flies in May and June, or in northern localities in July. It is abundant in a great part of Europe and is also recorded from Transcaucasia and parts of Siberia.

C. deflorata *Ersch.* (= *lepidaria* *Chr.*) is nearly related to *montanata*, especially resembling the form *lapponica*, but the lines are finer and of a brighter ferruginous colour, the postmedian sharply angled at the 3rd radial, the fringe of the forewing more strongly chequered, the hindwing weakly marked, but with some prominent ochreous spots at the margin, the dark underside sharply marked with white lines. Dauria to Amurland.

C. rectifasciaria *Led.* (= *orthogrammaria* *Guen.*) is shaped like *azonaria* (9b) to which it bears some superficial similarity. Forewing dirty white with dark (blackish brown) basal and median bands, the latter of medium breadth, its distal edge unusually straight, only with an extremely weak outward bend at the 3rd radial; the intermediate area traversed by 2 dark parallel lines. Hindwing dirty white with several waved dark lines nearly parallel to the distal margin, becoming indistinct anteriorly. Under surface more weakly marked. Both wings above and beneath bear a dark discal spot. Transcaucasia. The antennal pectinations in the ♂ are longer than in *fluctuata*.

conspectaria. **C. conspectaria** Mann (= *rupicola* Woll., *insulariata* Willgrn.) (12c). Very variable but easy to recognize by its dark colouring, strong reddish-ochreous gloss on both wings, long palpus, long antennal pectinations, crenulate distal margin of the hindwing and other characters. Occasional individual specimens may somewhat resemble certain forms of *quadrifasiata* Cl. but the more ochreous hindwing, with appreciably more crenulate margin, remains distinctive. Other examples, again, recall the coloration of *bistrigata* Tr., which is smaller, with white lines on the hindwing, more strongly chequered fringes and several structural differences. *conspectaria* was discovered in Sicily, but seems common in Madeira.

inaequata. **C. inaequata** Warr. (12c). Even more variable than the preceding. Smaller, the antennal pectinations less long, the distal margin of the hindwing less crenulate. The wings show, except in rare aberrations, no distinct ochreous gloss and the hindwing is often bicoloured, being darker and grey as far as the postmedian line, paler and sometimes ochreous distally. Forewing light brown, red-brown, fuscous or occasionally clear ochreous, the median area rather broad, sometimes scarcely differentiated in colour but oftener darkened (blackish, dark grey, dark fuscous or red-brown), bounded by fine whitish lines or at least by rows of white dots; subterminal line almost or altogether obsolete, a pair of indistinct greyish spots sometimes present between the radials. The most brightly reddish or ochreous forms seem always to belong to the ♀ sex. Common in the Azores, March to May.

quadrifasiata. **C. quadrifasiata** Cl. (= *corculata* Hufn., *ligustrata* Schiff.) (9d). Forewing with proximal area pale grey with a glaucous tinge, median area moderately broad, black, or at least darkened with black lines, but generally remaining paler around the cell-spot. The ♀♀ are on an average somewhat larger and oftener have the median band and hindwing darkened. The extremes of variation have received separate names. — ab. *thedenii*. **thedenii** Lampa (= *atrofasciaria* Schille, *contrastaria* Fuchs) has the median band quite solid, of a pleasing velvety black, the adjoining areas weakly marked. — In ab. *dissolutaria* Petersen the band is altogether dissolved into black lines. — *ignobilis* Btlr., from Japan, has the grey markings of the distal area extended, the ochreous brown almost suppressed, the dark spots between the radials usually large, confluent. Hindwing darkened. — Larva of moderate thickness, tapering slightly at the extremities, the skin rugose laterally; dorsal surface grey-brown, ventral lighter brown; an indistinct dorsal pattern of somewhat V-shaped dark marks followed by pale spots, then again often followed by a dark spot; a distinct black streak on the front of the first pair of prolegs. Polyphagous on low plants (dock, dead-nettle, primrose, etc. and even *Vaccinium*), hatching about August and hibernating. Pupa rather elongate, glossy yellowish red-brown. On the wing from the end of June to the first part of August, in some localities even as early as the end of May. It is local, but is common in many parts of Northern and Central Europe and its range extends to Eastern Siberia and Japan.

spadicearia. **C. spadicearia** Schiff. (= *ferrugaria* Haw., *chalcedonaria* H.-Sch., *ferrugata* Stgr.) (9e). Although I worked out very thoroughly, over 20 years ago, the differentiation of this species from the following, I unfortunately hesitated as to which was the true *ferrugata* of CLERCK and much confusion still prevails on that account. Thus even Dr. REBEL, in his excellent "Schmetterlingsbuch", has stated that he cannot find the essential difference in the ♂ genitalia, the explanation being that — misled by the nomenclature in STAUDINGER's Catalogue — he compared *ferrugata* and its ab. *unidentaria* and had not, until I recently pointed out the mistake to him, examined the other species, the true *spadicearia*. In *spadicearia* the ♂ genitalia are without teeth on the "harpes" and it further differs in having the forewing more strongly marked with lines, much more mixed with ferruginous-ochreous in the distal area or at least in the vicinity of the geminate dark spots, the median band differently shaped, often of a brighter or lighter red (less purplish), never black, the hindwing darker distally than proximally (in *ferrugata* quite weakly marked, or darker proximally than distally), the under surface much more strongly mixed with ochreous. It is very variable. — ab. *confixaria* H.-Sch. has the median band narrowed and the distal area somewhat weakly marked, rather uniformly ochreous. — *livinaria* Lah. is probably, as STAUDINGER indicates, a very extreme aberration with threadlike median band and broadly darkened distal area, similar to the example figured by BARRETT, pl. 344, fig. 3 g. — ab. *georgi* Meissl is an extraordinary, dark brown aberration with the median band only indicated by a narrow dark proximal bar and a narrow dark distal one, the latter only distinct costally. — ab. *deletata* Fuchs is nearly unicolorous grey, the forewing with reddish tinge basally and along the costal margin. — *tromsoensis* Fuchs (= *alpinata* F. Hoffmann) (9e, as *alpinata*) is a prevalent form at high elevations and high latitudes, but scarcely a fixed geographical race; median band paler, sometimes almost obsolete, the lines which traverse it remaining distinct. Typical *spadicearia*, including the above-described aberrations, inhabits the greater part of Europe (except some southern localities) and is also found in Siberia (Tunka and Sajan). — *asiatica* Stgr., from the Tarbagatai district to Issyk-kul, is a very distinct race or possibly separate species with the ground-colour somewhat yellowish, rather copiously (especially in the distal area) marked with darker yellowish, the basal and median areas of the forewing very dull reddish to blackish, the latter much straighter-edged than in the other forms, the proximal half of the hindwing rather strongly darkened. — The larva of *spadicearia* is somewhat elongate,

slightly tapering anteriorly; variable in colour, usually grey-brown, a dark dorsal line on the thorax and the last few segments of the abdomen, the intermediate segments with pale dorsal lozenges, each containing a distinct black mark. Polyphagous on low plants. Pupa glossy red-brown with the wing-cases somewhat darker. Double-brooded; the first generation flies in May and June, sometimes already in April, the second in July—August. Generally common, but less so in some parts of Europe than the following and showing a preference for drier places.

C. ferrugata Cl. (= *corculata* Prout olim, nec Hufn.) (9e). For the differentiation from *spadicearia*, *ferrugata*. see under that species. ♂ genitalia with a row of sharp teeth on the harpes. The name-typical form of *ferrugata* as figured by CLERCK and well described by LINNÉ, has the median band reddish or purplish, the distal area very weakly marked (except the costal patch and two dark spots between the radials), often almost entirely white or whitish. — ab. **unidentaria** Haw. (= *eximiata* Fuchs, *strandi* Krulik.) (9e) is a very common *unidentaria*. and very interesting aberration which has been proved, by my very extensive breeding experiments and those of Dr. DRAUDT, to be an almost perfect Mendelian “recessive”. It differs in having the median band black, not reddish. — ab. **coarctata** Prout has the median band greatly narrowed, only 1—2 mm. in width; the rest of *coarctata*. the markings often in part obsolete. — **bilbainensis** Fuchs, from Bilbao, said to be a local race, is described *bilbainensis*. as smaller, narrower-winged, the distal edge of the median band more distinctly biangulate. I doubt its validity. — **stupida** Alph., from Issyk-kul, Tibet, W. Central China, etc., is rather larger, with whiter hindwing, *stupida*. otherwise similar to ab. *unidentaria*. — Larva closely similar to that of *spadicearia*, the dorsal surface on an average less sharply marked. Polyphagous on low plants. Pupa similar to that of *spadicearia* but darker. Distributed in two generations in Europe and probably Siberia; also rather common in North America.

C. divergens Btlr. (11i) bears perhaps more resemblance in the general arrangement of its markings *divergens*. to some of the species of section B (*designata* or *abrasaria*) than to any of the preceding; but the base of the forewing is scarcely darkened, while there is a rather straight dark band *limiting* the basal area. The paler part of the median area is slightly variable in colour, greyish, brownish or even pale reddish. Hindwing always weakly marked. Dharmasala and other places in N. W. India.

B. Antennal pectinations rudimentary, bearing fascicles of long cilia (*Ochyria*).

C. apiciata Stgr. Superficially very different in appearance from the other species of this group, so *apiciata*. closely resembling *acutangulata* or certain forms of *disjunctaria* (7f) that it might even be confused with them. It is best distinguished by the very pointed forewing, which is even more acute than in *putridaria*. Its colour is dirty light-grey; with double dark line near the base, dark median area, divided costally by a pale patch, and one or two dark lines in the distal area. Hindwing light grey, beneath with an indistinct cell-dot and a dark, mostly strongly bent or angled postmedian line. The dull coloration of the upperside and the markings of the hindwing beneath are said to be, next to the structure and shape, the best distinguishing characters. I have not seen it. Achalzik district.

C. saturata Guen. (= *exlitorata* Walk., *livida* Btlr., *inamoena* Btlr.) (7f). Very similar, except *saturata*. in the ♂ antennal structure, to *ferrugata* L., the band brown rather than red or black, rather distinctly marked with black lines. Under surface rather weakly marked. The ♀ is broader-banded than the ♂, with the distal area generally more dark-marked. Very widely distributed. — Japan, China, India and S. Africa. The ♂ antennal pectinations are quite rudimentary, scarcely more than serrations.

C. angularia Leech (13). Closely related to *saturata* but with the band of the forewing blackish, the distal *angularia*. area infuscated, hindwing much darker than in *saturata*, underside more strongly marked, the pale band distally to the postmedian being well expressed. Japan: Oiwake and Nikko.

C. biriviata Bkh. (= *quadrifasciaria* Tr. nec L., *pomoeriaria* Ev.) (9e, as *pomoeriaria*) is easily distinguished *biriviata*. from the two preceding by its white ground-colour and the sharpness and brightness of its markings. — **aestiva** *aestiva*. Fuchs is the summer brood, distinguished by its somewhat darker colouring, especially in the distal area of the forewing and on the hindwing. — ab. **abditaria** H.-Sch. has the median band narrow, curved proximally at *abditaria*. costa and scarcely projecting posteriorly. — Larva green or brown, the dorsal line interrupted on the first 5 abdominal segments by light-bordered lozenge-shaped spots; lateral stripe whitish yellow. On Impatiens. Pupa blackish brown, hibernating. The first brood of the imago appears in April and May, the second in July. Distributed in Central Europe, Russia, Siberia, etc.

C. designata Hufn. (= *propugnata* Schiff., *bajutzaria* Franzenau) (9e) is the only species of the subgenus *designata*. in which the median band is light red — coloured nearly as in *munitata* but with a conspicuous black bar at its

proximal edge and usually with the distal edge also — at least in its anterior part, conspicuously black. *coarctata*. Under surface more weakly marked. — ab. *coarctata* ab. nov. has the median band greatly narrowed, usually very dark, about as in the corresponding aberration of *ferrugata*. — *islandicaria* Stgr. has the ground-colour more weakly marked, often whiter, the median band also pale in its centre but commonly with the black edgings widened. Iceland. — Larva very similar to that of *fluctuata*. On various Cruciferae. Pupa moderately stout, dark brown; hibernates. The moth flies in May and June, with a partial second generation from the end of July. It is common and widely distributed in Europe, Asiatic Russia and Japan.

bigeminata. **C. bigeminata** Chr. Nearest to some examples of *designata islandicaria* but with more elongate, pointed forewing, straighter distal margin, the median band only indicated by two narrow fuscous bars which limit it, the distal more slightly and bluntly projecting in the middle than in *designata*, the hindwing whitish grey with a tinge of yellowish and without markings. The dark basal area of the forewing rather smaller than in *designata*, distal area almost unmarked except the brown costal spot. Transcaspia: Kopet-dagh, near Ashkhabad.

modestaria. **C. modestaria** Ersch. is said to be also nearly related to *designata* but differs at once in the entire absence of the black bands or bars which border the median area of the forewing. Dirty whitish grey, the forewing with purplish basal and median bands, the former (according to von HEDEMANN's figure) almost straight-edged, the latter rather narrow, of almost uniform width throughout, without distal projection. Hindwing whitish with 2 ill-defined grey lines. Irkutsk. I have before me as "*modestaria*", a small species agreeing in markings with the figure, but narrower, apex of forewing somewhat falcate, etc. If this is rightly determined, the species has no connection with *designata*, the ♂ antenna being simple, the discocellulars biangulate.

abrasaria. **C. abrasaria** H.-Sch. (= *ligularia* Guen., *baicalata* Brem.) (9e). On an average slightly smaller than most of the other species, the median band not darkened except towards its edges, which are blackened somewhat as in *designata* though on an average more broadly. Somewhat variable, but I know of no striking aberrations. *abrasaria* is in Europe confined to the Arctic regions of Scandinavia and Russia. It is also recorded from N. E. Siberia and a local race, differing very little, inhabits Arctic and Subarctic America and the Rocky Mountains.

C: Antennal pectinations reduced to mere teeth, bearing fascicles of long cilia. Hindwing with distal margin uneven (*Orthonama*).

obstipata. **C. obstipata** F. (= *fluviata* Hbn., *gemma* Hbn.) (9e) is noteworthy for its strong sexual dimorphism. The ♂ somewhat recalls in coloration the following species, though it is brown, the distal edge of the median band more irregular, the hindwing more strongly marked, etc. The ♀, which we also figure, is much darker red-brown or purple-brown, nearly always with a conspicuous, often black-pupilled white spot in the middle of the forewing. Both sexes are moderately variable. — ab. *marginata* Mathew differs in having the fringe distinctly pearly grey instead of almost concolorous with the wings. It occurs in both sexes. — ♂-ab. *obsoleta* Mathew. Dark median band almost or altogether obsolete. — ♀-ab. *olivacea* Mathew. The purple-brown ground-colour replaced by olive-brown. — Larva nearly cylindrical, anteriorly somewhat tapering and flattened; head small, distinctly bilobed; body very variable in colour, grey, brown or green, etc., sometimes very weakly marked, oftener with distinct dark dorsal, subdorsal and lateral lines on thorax and posterior segments, the middle segments with pale, dark-edged, lozenge-shaped dorsal markings, in each of which a dark spot represents the broken dorsal line. Probably polyphagous on low plants, chiefly obtained by rearing from the egg. It feeds up very rapidly in high temperatures. Pupa brown, rather rough and pitted but with the wings smooth and very glossy; cremaster darker brown. The moth appears in a succession of broods throughout the warm season and has a wonderful range of distribution, embracing most of Europe, Asia, Africa, N. America and the eastern side of S. America, in cooler climates scarce and uncertain in its appearance, no doubt maintaining itself by immigration.

lignata. **C. lignata** Hbn. (= *lineataria* Don., *vittata* Bkh. nec Thnb.) (9f). Face without distinct cone of scales. Forewing pale wood-colour, the dark lines (except the conspicuous blackish apical streak) approximately parallel with the distal margin, those which follow the discal dot rectangularly bent near the costa. Hindwing still paler. — In ab. *nigrofascia* Rbl. the black apical streak is continued as a blackgrey nebulous stripe as far as the hindwing, the subterminal line distinct, the proximal lines wanting. Larva moderately stout, tapering slightly and gradually; yellowish green, the middle segments dorsally somewhat suffused with brownish pink; dorsal line darker, thickening somewhat at the incisions; subdorsal pale, usually finely dark-edged; a black dash on the side of each segment; spiracles and spiracular line pale red. It feeds on *Galium palustre*, hibernates and is full grown about May. Pupa short, glossy, dorsally dark brown, wings and ventral surface bronzy green. The moth is on the wing in June or a little earlier or later and as a second generation in August-

September. Locally common but apparently almost confined to Northern and Northern Central Europe and not reaching the Arctic Region.

Subgenus *Calostigia* Hbn. (= *Malenydris* Hbn., *Amoebe* Hbn.). Like *Xanthorhoë* but with discocellulars of hindwing biangulate. Probably embraces 3 or 4 biologically distinct sections, but I have found no well-marked imaginal characters for their separation.

A. Antennal pectinations fully developed.

C. albigirata Koll. (= *serpentina* Led., *jameza* Btlr., *askoldaria* Ob., *thomasata* Warr.) (9b) is easily *albigirata*. known by the strongly glossy wings, recalling the colour of *suffumata* or *silacea*, and especially by the very characteristic form of the distal edge of the median band, which behind the middle forms a marked projection and then runs *very obliquely inwards* to the 2nd median vein where it forms an acute angle, being afterwards somewhat outcurved. The hindwing beneath has a strong black discal dot and strong, though somewhat broken postmedian line. Japan, S. E. Siberia, W. China, Kashmir and the Altai. — **viperata** Alph. is said to differ in *viperata*. its more cupreous or brownish tint and in having the ♂ antenna more shortly pectinate. Amdo district.

C. ustipennis Hmps. (11f) differs essentially from *albigirata* in colour, both wings being reddish fawn- *ustipennis*. colour (the hindwing greyer in its proximal part). The fine white lines which limit the basal and median areas recall those of *albigirata* but the median area of the forewing is broader, its proximal margin less acutely indented, its distal much less irregularly shaped than in that species. Dharmasala.

C. aptata Hbn. (9a) and the two following species form a closely related group with more or less green *aptata*. forewings. *aptata* is especially similar to *olivata* but differs in its whiter ground-colour, paler hindwing and on an average narrower median band. — ab. **suplata** Frr. (= *pontissalaria* Brd.) Forewing not greenish, the *suplata*. median band unicolorous fuscous. — ab. **confusa** Hirschke. Median band reduced to a small dark patch about *confusa*. the discocellulars. — Little is known of the earlier stages. According to de ROUGEMONT the larva is grey-yellow with black dots and with short hairs. On *Galium*. *aptata* is essentially a mountain species and occurs in Central and Southern Central Europe. Westward it reaches the Pyrenees, but is not yet recorded from Spain; eastward it reaches the Altai Mountains. It flies in July.

C. olivata Schiff. (= *aptata* Dup. nec Hbn.) (9a). When fresh, the forewing is of a beautiful mossy *olivata*. green, the ♂ usually smaller and darker than the ♀. Hindwing dark grey, with paler double postmedian line and dentate or lunulate pale subterminal. — ab. **semisuffusa** Ckll. has the entire proximal area of the fore- *semisuffusa*. wing dark-suffused, confluent with the median band. — The newly-hatched larva is similar to that of *pectinataria*. It hibernates when still quite small and feeds up in the spring. Full-grown it is stout, slightly tapering at each end, rugose, with conspicuous tubercles and setae; reddish-ochreous or brownish ochreous with interrupted grey dorsal line; lateral and ventral surface mostly dull reddish; tubercles black. Exceedingly sluggish, feeding on *Galium* at night. Pupa rather stout, bright red or red-brown, the abdomen darker. The moth appears in July and August, sometimes earlier. Northern Europe, also further south in mountainous country, even reaching Sicily; also in the Ural, the Caucasus, N. E. Asia Minor and the Altai.

C. pectinataria Knoch (= *deleataria* Thnbg., *viridaria* F. nec Cl.) (9a). Cannot be confused with any *pectinataria*. other known species; the triangular black spots at the costa and the light green ground-colour being distinctive. When it has been exposed to damp weather the green fades to a dirty yellow or whitish and the black spots stand out even more distinctly. Such specimens have been named ab. (!) *derassaria* by SCHILLE and *deviridata* by STRAND. — ab. **constricta** ab. nov. Median area much narrowed so that it forms costally a *single* black *constricta*. mark, its posterior one-third white. In coll. W. G. SHELDON. — The newly hatched larva is rather large, bright red or red-orange, with rather large blackish tubercles and very small, knobbed-tipped setae — very different in appearance from newly hatched *Xanthorhoë* larvae. Full fed it resembles in shape and in rugosity that of *olivata* but shows on the back of the middle segments a reddish V-shaped pattern. On *Galium*, *Lamium* and other low plants. Extremely sluggish, feeding by night. Usually hibernates when well grown. Pupa yellow-brown. The moth is common in woods, wooded heaths, etc., in June and July; a partial second brood (of smaller size) in August - September Central and Northern Europe and a few southern localities; also Transcaucasia and the Altai.

C. turbata Hbn. (9a). A rather uncommon-looking species on account of the very dark-bordered, *turbata*. clear white hindwing. The forewing is brown-grey, appreciably mixed with olive green, the median band often darker. Geographically variable. The name-typical form inhabits the Alps, Pyrenees, Central Scandinavia, Finland and the Altai. The Canadian race will be described in vol. 8, but there are two other European races to register. — **fuscolimbata** Tgstr. (= *arctica* Schöyen) is a small, pale form from the polar regions — *fusco-*
limbata.

pyrenaea-ria. Arctic Norway to N. W. Russia. — **pyrenaea** *Ob.* has the median band of the forewing pale, on the hindwing a fuscous postmedian line in addition to the dark border. It is the principal, though not the exclusive form in the Pyrenees. — The early stages are apparently unknown.

kollariaria. **C. kollariaria** *H.-Sch.* (9b). A rather large species with dull mossy green, brownish-mixed forewings, marked with brown basal patch and moderately broad median band. ♂ antennal pectinations rather long. — *ab. obscurata* *F. Hoffmann* has the forewing much darkened, being dark-brown mixed with black-brown. — *ab. hilariata.* **hilariata** *Schawerda*. Ground-colour paler, median band sharply contrasted. — *ab. insulata* *Schawerda*. Median band intersected by black lines which divide it into several separate patches. — The life-history of *kollariaria* is unknown. It is distributed in the Swiss and Austrian Alps and occurs in Bosnia. Its reputed occurrence in E. Siberia requires confirmation.

laetaria. **C. laetaria** *Lah.* (= *viridicinctaria* *Peyer.*) (9b) has commonly been regarded as a local race of the preceding, but those authors who have given the closest study to it declare it to be a separate species. DELAHARPE differentiated it by its somewhat longer palpus, rather smaller size, less rounded wings, more sinuous postmedian line, median band narrowing towards the costa, anterior half of subterminal line clear white, discal mark larger, broader. Some of these differences have been called in question or have proved inconstant but *laetaria*, in its typical form and when in fresh condition, is a brighter blue-green insect, without brown admixture and probably this, combined with the shape of the band, will give sufficient distinction. *laurentiaria.* RÄTZER compared over 40 of each species and supported DELAHARPE. Local in the Swiss Alps. — **laurentiaria** *Brd.* is the French form, with paler green ground-colour and brown, not green-mixed median band. It is not rare in the mountains about Uriage, on Mont Revard, above Aix-le-Bains, and in the mountains of Doubs. — *laetaria* is on the wing from June to September, at altitudes of from 476 m to 1800 m. According to OBERTHÜR it seems that the form *laurentiaria* flies chiefly in June.

varonaria. **C. varonaria** *Vorbr. and Müll.-Rutz.* A recently erected species, said to form with the two following a distinct group. Pectinations as in *austriacaria*, while in *püngeleri* they project more from the antennal shaft. Expanse of ♂ 29 mm, of ♀ 24 mm (German system of measurement). ♂ forewing strikingly triangular, hindwing decidedly narrower and more elongate than in the allies. Forewing grey-green, slightly yellowish, hindwing ash-grey. ♂ forewing with a broad, obscure median band which is sometimes lighter in its middle part but always distally and which is also indicated on the hindwing. ♀ more strongly marked; median band always divided with whitish, so that the forewing appears traversed by numerous black-grey wavy lines. Fringes black-chequered. Under surface unmarked. Discovered by Miss de ROUGEMONT on the Alpe Varone between 2000 and 2400 m, sitting on rocks or drinking at puddles. June.

püngeleri. **C. püngeleri** *Stertz* is nearly related to *austriacaria* (9b) but with broader wings, longer, more projecting antennal pectinations, etc. The wings have the same smooth, glossy scaling as in *austriacaria*, but have a greenish tone which is wanting in that species; the distal projection in the postmedian line of the forewing is somewhat more acute, the pale band on the hindwing whiter. According to REBEL the antennal distinction is not constant. Zermatt in July at an elevation of about 2500 m, sitting on rocks, but hitherto always scarce.

austriacaria. **C. austriacaria** *H.-Sch.* (9b) is easily recognizable by its elongate, glossy grey wings and whitish head and face. The markings are generally weak in the ♂, stronger in the ♀. The ♂ antennal pectinations are of moderate length, usually lying rather flat against the shaft. Austrian Alps. STAUDINGER records a variety from the Pyrenees but I have no knowledge of it.

tempestaria. **C. tempestaria** *H.-Sch.* (9b). Much larger than *austriacaria*, more whitish grey, sometimes with a yellowish admixture, the discal dots obsolete, the under surface sharply marked. ♂ antenna pectinate as far as the apex. Southern Tyrol and Carniola, at elevations of 1700—2500 m sitting on rocks. Very scarce and local, end of June—July.

aqueata. **C. aqueata** *Hbn.* (= *lotaria* *Bsd.*) (9b) is another strongly glossy species, but smaller than the preceding group, about the size of *salicata*. Head white, as in *austriacaria*, from which it differs in size, rather less elongate wings, more whitish grey ground-colour, without a tinge of brown, etc. The typical form, when in good condition, has a very strong tinge of green in the forewing. — **hercegovinensis** *Rbl.*, from Bosnia and Herzegovina, is a whiter form without the least admixture of green. — Larva moderately elongate, tapering anteriorly, rugose; head small, round, brown; on the last segments the posterior pair of dorsal tubercles enlarged; colour dirty greenish yellow or clay-colour, with very indistinct and interrupted dark dorsal and subdorsal lines and broad paler lateral stripe. It hibernates and is full grown in April or May. The moth flies in June and July and is not rare in the mountains of Central and Southern Central Europe.

C. schneideraria *Led.* (9 c). Shape and markings much as in *tophaceata*, from which it differs in its smaller size and in the antennal structure. Antenna rather long, in ♂ with moderately long pectinations. Ground-colour of forewing light brownish ochreous, the markings dark grey. Under surface in its distal half sharply marked. Not uncommon at Beyrut in April and May, resting on rocks in shady places. — **taurica** *Stgr.*, from the Taurus, is a darker, duller form, almost or altogether without ochreous admixture. *schneideraria.*

C. salicata is very variable in colour, but the markings vary little and as the most similar species (the *nebulata*-group) lack the pectinated antenna of the ♂, there need be no difficulty in determining it. Broader-winged than *schneideraria*, the hindwing and underside less sharply marked. It breaks up into some very distinct local races. — **salicata** *Hbn.* (= *latentaria* *Curt.*, *podevinaria* *H.-Sch.*, *ferrata* *H.-Sch.*) (9 b) is grey, with darker brown-grey or greenish-grey bands and clouding, the narrow bands on each side of the median (or at least the distal one) sometimes clear whitish. N. England, Scotland, Belgium, the Alps and the mountains of Hungary and Galicia, thus a northern and mountain form. British specimens are on the whole darker. — **probaria** *H.-Sch.* is a much paler, ash-grey form, sometimes quite whitish, recalling the coloration of *nebulata*. Capri, the Adriatic states of Austria, Greece. — **ablutaria** *Bsd.* (= *ruficinctaria* *Guen.*) differs in showing more or less strong admixture of yellow scales. Widely distributed in southern Europe and Asia Minor, Syria and Mesopotamia. — **ochracearia** *Stgr.* Prevailing colour light ochreous with the bands darker ochreous. *salicata.*
probaria.
ablutaria.
ochracearia.
STAUDINGER records it from Beyrut only. — Larva moderately stout, pale reddish brown, the dark dorsal line finely pale-edged, subdorsal line fine, yellowish, lateral stripe broadly yellow; spiracles black; tubercles small, black, setae short. On Galium and other low plants. It hibernates in the pupal cocoon. The perfect insect thus appears very early in southern localities (March—April), but further north not till June or July; a second brood in August—September.

C. flavolineata *Stgr.* is said to be related to *salicata* but much smaller, the forewing blackish grey with a divided greenish-yellow band (or double line) at one-third and a second at two-thirds, the band which lies between them finely white-edged, the distal area somewhat lighter than the median, with a conspicuous white spot in the apex; the yellow bands (or lines) are weakly dentate, the postmedian shaped somewhat as in *salicata*. Hindwing dirty grey with very indistinct light postmedian band. Forewing beneath glossy grey; hindwing more whitish grey with dark discal dot and dark lines bounding the pale postmedian band. Palpus relatively rather long. Antennal pectinations as in *salicata*. Since quoting this description I have seen specimens; only a small basal patch and rather narrow median band are really "blackish grey" (blackest on the veins) and even these vary in colour, being sometimes brown. Granada in October, sitting on rocks in steep and dangerous places. Also in the Pyrenees Orientales in September, beaten from Erica arborea. MENDES records it for Portugal. *flavolineata.*

L. multistrigaria *Haw.* (9 c). Long-winged, the costal margin of the hindwing at least as long in proportion as in *Ortholitha*, but the wings narrower, less strongly built. The ♀ considerably smaller than the ♂. Characterized chiefly by the strongly dotted veins of the forewing, alternately dark and light. Antenna in ♂ rather short, with moderate, rather flat-lying pectinations. — ab. **nubilata** *Tutt* is a much darkened form from the north of England, with almost unicolorous fuscous forewing, the hindwing also darkened. — ab. **virgata** *Tutt* resembles the typical form but has a darker, more solid median band on the forewing. — **olbiaria** *Mill.* (= *punctatissima* *Stgr.*) is a paler, weakly-banded race from S. E. France and Catalonia. The dark dots on the veins are as strong as in the name-type and thus appear relatively stronger. — The type form of *multistrigaria* is common in many parts of England and is also recorded from Holland and parts of France and Spain. Larva uniformly cylindrical, brown-grey, tinged with green dorsally, rather paler ventrally, a blackish dorsal line, at least on last few segments; spiracles minute, blackish. On Galium. Pupa dark reddish, dorsally and anally more black. Imago in March and April, the southern form *olbiaria* in December and January, sometimes already in November. *multistrigaria.*
nubilata.
virgata.
olbiaria.

C. didymata *L.* (= *scabrata* *Hb.* = *alpestrata* *Hb.*) (9 c). Very variable in colour, the ♂ considerably darker than the ♀; in some districts the sexual dimorphism is quite striking. This sex is also appreciably smaller and narrower-winged than the ♂ and has a much stouter abdomen. — ab. **ochroleucata** *Auriv.* Unicolorous grey-yellow or yellow-brown without markings except the light subterminal line. — ab. **nigrofasciata** *Rbl.* Ground-colour darkened, median band narrow, almost black. — ab. **nigra** *Prout* (= *atra* *Rbl.*). Both wings uniform blackish brown. I only know 2 or 3 ♂♂, from Scotland, and do not suppose the form occurs in the ♀. — **hethlandica** *Rbl.* ♂ more or less bright orange brown, ♀ lighter ochreous-brown or fawn-colour. Shetland Islands. — The egg hibernates. The larva when first hatched shows affinity with that of *multistrigaria*. The adult larva is slender, tapering anteriorly; head rounded, dull green; body green, dorsal line darker, subdorsal whitish, a broad white lateral stripe, sometimes suffused with reddish; anal extremity with two backward-projecting points. Polyphagous on low plants, often preferring the flowers; March—June. Pupa *didymata.*
ochroleucata.
nigrofasciata.
nigra.
hethlandica.

stout, greenish, the anterior part and wings sometimes ochreous. *didymata* is abundant in most parts of Northern and Central Europe; further south and east it seems to be confined to the mountains — Pyrenees, Alps, Ural. It is on the wing in July and part of August.

- icterica.* **C. icterica** *Djakonov* agrees in structure with *didymata* except in the ♂ genitalia. Deep ochreous, about as in *Ptychopoda serpentata* (4a), rather variable in colour, the ♀ in general lighter than the ♂. Forewing with 8 brown lines, the 2 which limit the median area the most distinct, the area itself not or little darkened, basal not darkened; discal dot sometimes obsolete; distal area much darkened, always with distinct light subterminal. Hindwing light ochreous, in strongly marked examples with 4 lines and darkened distal area. From 2 or 3 localities in the province of Semiretshje. I have not seen it.
- corydalaria.* **C. corydalaria** *Graes.* (10e) is very distinct from all the preceding species of the group in its scheme of coloration, which rather recalls the *Eulype* and *Epirrhoë* groups; discocellulars of the hindwing only weakly biangulate. The antennal pectinations are rather long, widely separated. The name-typical form, from the Amur and Ussuri district (perhaps also from the Black Sea Government), has the white markings conspicuous; in particular the postmedian band, especially on the forewing, is broad and uninterrupted. — **bogumilaria** *Rbl.* is a European representative with the white median band more or less strongly reduced and interrupted, the antemedian line and the distal white spots on the contrary somewhat extended. Croatia and N. Bosnia —
- eurytaenia.* **eurytaenia** *Rbl.* (10f) has the white markings wider than in *bogumilaria*, especially the postmedian band on both wings, yet this does not assume the same width as in the Asiatic form, while the antemedian white markings of the forewing remain as conspicuous as (or even more conspicuous than) in *bogumilaria*. S. E. Bosnia. Flies in July and August.
- bellaria.* **C. bellaria** *Leech* (7k) agrees with *corydalaria* in structure and is perhaps nothing more than a further race of it, characterized by the strong reduction of the black markings in the proximal half of both wings. W. China: Ta-chien-lu, Ni-tou and Chang-yang.
- pendearia.* **C. pendearia** *Ob.* (= *moupinata* *Powj.*) (13d). The affinities of this and the remaining species of the group are somewhat uncertain, but they agree with the subgeneric characters here given. *pendearia* is characterized by its rather broad median area which does not narrow at all (but indeed usually appreciably *widens*) posteriorly, otherwise it is marked rather like *correlata*, but the wings are differently shaped, the size larger, the centre of the median area grey, not whitish, the hindwing more suffused, with postmedian line strongly marked on the veins. W. China, June-August.
- grataria.* **C. grataria** *Leech* (11h) is a broad-winged species, the hindwing slightly angulated at the 2nd subcostal, thence with the margin gently undulate, palpus rather long, ♂ antenna fully pectinated. WARREN founded for it a genus *Amoebotricha*, placing here also the following species (*correlata*). Japan: Nikko, Oiwake, Nagasaki, September—October and even as late, in the last-named locality, as the beginning of December.
- correlata.* **C. correlata** *Warr.* (= *badiata* *Leech* nec *Schiff.*) does not seem to me very closely related to the preceding. Rather smaller, the antennal pectinations shorter, the hindwing rather more produced at apex, its distal margin more crenulate, forewing without the large triangular costal marks. Altogether closely similar to *badiata* (10m), except in the pectinate ♂ antenna. Whitish grey, the hindwing whiter; markings nearly as in *badiata*. Gifu.
- B. Antennal pectinations extremely short, with dense, short ciliation.
- parallelo-lineata.* **C. parallelolineata** *Retz.* (= *vespertina* *Schiff.* nec *L.*, *parallelaria* *Vill.* nec *Schiff.*, *sudduplicaria* *Costa*) (9d). Quite distinct in appearance, as well as in structure, the lines of the forewing parallel, rather straight, apical black dash only represented in the fringe and in an enlargement of the first of a series of subterminal dark dots. The ♀ is whiter than the ♂. Underside, especially in ♂, browner, both wings with discal dot and two lines beyond it, all usually distinct. — ab. **infusata** *Rbl.* has the forewing, the distal area of the hindwing and the entire underside strongly darkened with sooty brown. — The egg hibernates. Larva rather slender, green, head light brown, dorsal line fine, dark. It feeds on various low plants in May and June. Pupa rather compact, yellowish brown, the margins of the segments dotted, the cremaster short with the hooks divergent. The moth flies in August and September in the mountain districts of Central-Europe and extending eastward to the Altai.
- Subgenus *Psychophora* *Kirby* (= *Scinneria* *Dyar*). Differs from *Xanthorhoë* in the rather smaller eye, hairy palpus, commonly exerted ♂ genitalia and frequently in having the areole undivided.
- frigidaria.* **C. frigidaria** *Guen.* (9a). Recognizable by the narrow wings, the forewing triangular with rather acute apex, the hindwing also produced towards the apex, but rounded, and especially by the structural characters. The

antennal pectinations are short and fusiform. Forewing smoky grey-brown, somewhat glossy, the darker sub-basal, antemedian and postmedian lines sometimes enclosing slightly darker areas, the central area rather narrow; these lines are edged by pale ones; subbasal angulated anteriorly; antemedian strongly curved, subcrenulate; postmedian lunulate-dentate. Hindwing paler, with postmedian line indicated. Under surface paler, both wings with postmedian line. Areole nearly always single. Inhabits Arctic Norway, Lapland, Nova Zembla etc. For a further discussion of this group the reader is referred to vol. 8. Our figure, 9 a, is too broad-winged, too sharply marked and with the median band too broad and I suspect an error in determination.

Subgenus *Lampropteryx* Steph. (= *Anisobole* Warr.). Antenna in ♂ with fascicles of cilia. Areole double. Hindwing with discocellulars biangulate.

C. suffumata Schiff. (9 d). A very glossy species, not likely to be confused with any other known to me. In many localities very constant, but in some places striking aberrations occur together with the type-form. — ab. **piceata** Steph. is almost unicolorous fuscous. It is a prevalent form in some parts of N. England and Scotland and also occurs in Norway, Switzerland and apparently one or two Asiatic localities. — ab. **porrittii** Robs. and Gardn. (= *carringtoni* Rbl.) is a very beautiful aberration with the ground-colour uniformly pale yellowish or white, the basal and median bands darkened and all the other markings obsolete except a subapical mark. It occurs in Kent (Dover) and S. W. Yorkshire and apparently bears a Mendelian relationship to the type. — **defumata** Stichel is a rather smaller (sometimes much smaller), in general weakly marked form from Northern Scandinavia. Less glossy than *minna*, hindwing not darkened. — Larva of medium thickness, rugose, the incisions well marked; head small, pale brown; body brown of various shades, dorsal surface darker than ventral, the first 5 abdominal segments each with a V-shaped dark mark, pointing forward and containing a small, pale-edged dark mark; setae well developed; spiracles deep black. On *Galium* in May and June. The moth develops about August but hibernates with in the pupal shell, like *Taeniocampa*, generally emerging in April or the beginning of May. Sometimes it does not appear till June or even July, but there is no evidence of second brood in nature, though in captivity such has occasionally been obtained, in August or later. Local in Northern and Central Europe, Russia, Armenia, Altai the Thian-shan and W. China. — **minna** Btlr. (= minor Stgr.) is generally regarded as a local form of *suffumata* but may possibly be a separate closely-allied species. Smaller, the median band on an average broader, its distal edge with a broader, more rounded projection, the hindwing generally darker. Japan, Amur, Ussuri, the Kentei Mountains and N. India.

C. algiricata D. Luc. is described as near *suffumata* (9 d), but as the antennal ciliation is said to be very short I suppose it is not correctly placed here. Expanse 30 mm. Forewing rather elongate, yellow-brownish, with 3 very distinct black lines, accompanied by dark shading, the first and second (subbasal and antemedian) right-angled outward, the third (postmedian) parallel with the distal margin but with a double outward curve in the middle; between the latter and the margin a brown band running from a point near the apex, anteriorly fuscous; a fuscous patch near the margin. Hindwing above and beneath yellow-greyish, irrorated with brown; forewing beneath greyish, with the second and third lines distinct. Le Tarf, Algeria, in April. The figure suggests relationship with *cupreata*.

C. nitidaria Leech. A handsome species, larger than *suffumata* and more variegated in colouring, the ground-colour of the forewing shaded with violet-grey, in the distal area whiter between the radials and with an ochreous suffusion about the 3rd radial and 1st median; basal and median areas black-brown, the former ample, with very strongly rounded edge; antemedian line mostly parallel with subbasal, more angled at fold, postmedian gently curved; median area rather narrow, especially posteriorly, in the type interrupted at the fold, 2nd median vein finely white; apex with a dark cloud, divided by fine white oblique line, subterminal line and pale veins. Pu-tsu-fong, June-July; also on Formosa. This species belongs to WARREN's genus *Paralophia*, ♂ abdomen with large hair-tufts on the sides of segments 5—7.

C. rotundaria Leech, of which only the ♀ is known, evidently also belongs to *Paralophia*. Rather larger than *suffumata*, the forewing broader, the coloration different, the proximal part of the distal area of the forewing and the entire hindwing (except the fringes) being of a glossy violet-grey instead of yellowish white; the basal and median areas are both very broad, only separated by a double pale line, which is formed as the antemedian of *suffumata*; subapical dark cloud ill-defined, with no distinct white line anteriorly to it; subterminal line reduced to a row of whitish dots. Under surface more weakly marked than in *suffumata*, more purple-brownish, both wings with the postmedian indicated and with subterminal row of pale dots. Mou-pin in June. Closely related to the Indian *siderifera* Moore, but I think distinct.

multipunctata. **C. multipunctata** Stgr. (9c) also belongs to the subgenus *Lampropteryx* according to the characters here employed, but the more slender build, thinner scaling and entirely different scheme of markings, seem to indicate that there is really no near relationship. Superficially *multipunctata* is scarcely distinguishable from some weakly-marked forms of *multistrigaria* Haw., the transverse lines wanting (as in the form *olbiaria*), the ground-colour of the forewing, on the other hand, still browner (more yellow-brown) than in name-typical *multistrigaria*; terminal dots weaker. Hindwing slightly less narrow, white-grey, almost unmarked, with brownish fringe. Underside white-grey, very glossy, lacking the distinct discal dots of *multistrigaria*, postmedian line weaker. Jerusalem, December-January. The ♀ is unknown and must be very sluggish or possibly wingless.

Subgenus *Asaphodes* Meyr. Like *Xanthorhoë* but with the areole undivided.

muscipata. **C. muscipata** Chr. (= *nigrozonaria* Leech) (9e) somewhat resembles a diminutive *ferrugata* ab. *undentaria* or *quadrifasciata*, but is very distinct from any other known species. The basal and median areas form a continuous, or almost continuous dark patch, mixed black-brown and blue-grey. Hindwing with traces of dark lines at the inner margin. Under surface reddish grey, indistinctly marked. Japan and S. E. Siberia, — *obfuscata.* **obfuscata** Warr. (= *rubridisca* Warr., *plumbeotincta* Swinh.) is on an average larger, with the dark clouding of the forewing very variable but showing a tendency to leave free the posterior part of the median area, extending only from base to discal dot and thence along the costal margin. Described from Sikkim but recently recorded by WILEMAN from Japan. Other forms of this variable species occur in Assam, Formosa and even in New Guinea.

Subgenus *Dasyuris* Guen. (= *Trichochlamys* Hulst). Antenna in ♂ simple. Face rough. Palpus and breast hairy. Areole double. Discocellulars not biangulate.

C. polata is referred by MEYRICK to the genus *Dasyuris*, which was founded by GUENÉE on the New Zealand species *partheniata*, and it agrees essentially therewith although the hairiness of the palpus and breast are not quite so well developed. CHAPMAN, on a study of the genitalia, unites it with the following subgenus. Under the name *polata* are assembled 3 or 4 different forms; perhaps representing 2 or 3 separate species, but I have not sufficient material for a thorough investigation. — *polata.* **polata** Dup. (= *cineraria* Schöyen) (9f) was described from "Lapland" and is the least glossy form, forewing strongly marked. — In ab. **constricta** Strand the median band is narrower, interrupted near the hindmargin. *polata* inhabits Lulea Lappmark, Saltdalen and Finmark, July-August. — *punctipes.* **punctipes** Curt. (= *polata* Hbn., nec Dup.) is very similar but rather narrower-winged, rather more glossy, the basal and median bands rarely so solid, the white parts seldom so clear white; hindwing generally with the first pale line broadened into an ill-defined band, discal dot generally small. Rather strongly variable. Labrador, Baffin Land and Boothia. The palpus seems rather more hairy than in the European type. — *brullei.* **brullei** Lef. (= *fumidotata* Walk.) is a melanotic form, nearly unicolorous black-grey with deeper black discal dot; the pale subterminal line is distinctly indicated. The fringes remain chequered, light and dark. Forms a local race in Greenland; in Lapland probably it may occur as a rare aberration. — *byssata.* **byssata** Auriv. (9f) is regarded by its author as a distinct species, and I am strongly inclined to concur in this opinion. Still more glossy than *punctipes*, greenish-grey or yellowish-grey, the median band not differentiated except by the indistinct paler grey (not white) lines which bound it. Hindwing also weakly marked, usually with a single pale line near the distal margin. Under surface quite weakly marked. — ab. **subbyssata** Strand has the median area constricted, otherwise like *byssata*. *byssata* is recorded from N. Scandinavia and N. E. *tundracata.* **tundracata** B. Poppius, from the peninsula of Kanin, is a modification of *byssata*, equally glossy but with more distinct markings, ground-colour usually more strongly mixed with yellow.

occata. **C. occata** Püng. Near *byssata* (9f) but larger, the forewing broader and less pointed, the hindwing sometimes more distinctly marked. Only known from the Saichin Mountains north of Korla, Central Asia.

Subgenus *Entephria* Hbn. (= *Glaucopteryx* Hbn.). Face without cone of scales. Areole double. Discocellulars more or less biangulate (except in *ravaria*, *fuscaria*, *cyanata*, *bastelbergeri*, *flexulata* and *uncinata*) ♂ genitalia with a special organ from below the aedoeagus, conical at its base, forming a more or less long stalk, terminally dilated and covered with tactile hairs.

ignorata. **C. ignorata** Stgr. probably belongs to this group, as STAUDINGER compares it with the 2 following species and with *polata*. Expanse about 30 mm (27 by STAUDINGER's measurement). Forewing light grey, with quite slight yellowish tinge and with sparse blackish scales; subbasal line thick, blackish; 2 or 3 faint lines between this and the antemedian; antemedian tolerably distinct, sharply dentate, the median band wanting, being only indicated by a slight darkening in the costal region immediately beyond this line; postmedian line very faint, chiefly indicated by a row of dark dots on the veins, at the hindmargin confluent with the antemedian in a small dark spot; two other lines formed of dots follow and a costal spot near the apex indicates the beginning of a further dark line; marginal line consisting of sharp black strokes or dots; fringe divided by a weak dark

line. Hindwing dirty light grey with very feeble, narrow band-like darkening distally; marginal line as on forewing. Underside light grey, only distinctly darkened at the apex of the forewing. Founded on a ♀ from Kurusch, Caucasus; August.

C. caesiata Schiff. (= infrequentata Haw.) (9f). Very variable, generally recognizable by the shape of the markings, which is well shown in our figure. The typical form is bluish grey, the median band moderately darkened, enclosing in the centre a costal patch of the pale ground-colour. — ab. **annosata** Zett. (9g) has the median band darker and not enclosing a light patch. — ab. **nigricans** Prout (= hethlandicaria B.-Haas) is glossy blackish or fuscous, the median band still darker, but the lines which bound the areas remain pale. Not infrequent in Yorkshire, Scotland, the Shetlands, etc. — ab. **constricta** Prout. Median band much narrowed, interrupted towards the hind margin. — ab. **epixantha** Stichel. Forewing more brownish, hindwing darkened proximally, pale distally, the two shades rather distinctly defined. One example bred among normal specimens. N. Sweden. — **calcarata** Vorbr. and Müll.-Rutz, from the peat-bogs of the Bernese Jura (Tramelan), is essentially lighter, tinged with brighter green-yellowish, much more sharply marked and with the pale costal patch always reaching right across the forewing. — **norvegica** Strand, the principal form in Arctic Norway, is less sharply marked than the type, rather uniform grey. — **glaciata** Germ. (= gelata Guen.), from Iceland, is darker (more brownish or smoky) than the type, generally weakly marked, not very strongly glossy. — ab. **prospiciuata** Prout (= gelata Stgr. nec Guen.) is white or whitish, unmarked except for the basal and median black-brown bands which stand out in the boldest relief. It occurs chiefly in Iceland. — **impallescens** Chr., from the N. E. Caucasus, is smaller and narrower than the type, the wings whitish, densely sprinkled with fuscous, the wavy transverse lines indistinct. According to STAUDINGER a similar form occurs in Labrador. — Larva of medium proportions; head small, brownish; body variable in colour, green or reddish with triangular red and yellow dorsal patches, edged by V-shaped black marks which point forwards; segment incisions well marked, and showing a number of white dashes. On heath, bilberry, Rhododendron, dwarf birch, dwarf willow, etc., hibernating. Pupa rather slender; glossy light-brown with the wings more greenish. *caesiata* flies in July and August, in Northern Europe and the mountains of Central Europe, also Armenia and the Altai and in North America, at least in Labrador.

C. ravaria Led. (13n) differs from *caesiata* in its stronger gloss, peculiar greenish grey tone, absence of discal dot on the hindwing above and on both wings beneath, very glossy, almost unmarked underside, etc. Discocellulars not biangulate. Genitalia not yet investigated. Variable in the breadth of the median band. Altai and Ala Tau Mountains; also at Koksar (?).

C. subravarica sp. nov. (9g, as *ravaria*). Smaller and rather narrower-winged than *ravaria*, lighter coloured, less greenish, postmedian line more proximally curved at costal margin, terminal line weak, less inclining to form paired dots. Antennal ciliation in the ♂ better developed (not much less than diameter of shaft). In the type and another ♂, the median band becomes very narrow at hindmargin. Aksu, E. Turkestan. Type in my collection, cotypes (♂ ♀) in coll. PÜNGELER. Has been circulated as *ravaria*.

C. fuscaria Leech is perhaps related to *ravaria*, but both wings are much darker leaden grey, the basal and median areas still darker, solid, the distal area almost unicolorous, the subterminal line being only faintly indicated. Hindwing with faint traces of double pale postmedian line. The ♂ antenna is abnormal for this group, the joints projecting strongly (dentate-ciliate). Ta-chien-lu, only the type known.

C. flavicinctata Hbn. (9g, as *flavocinctaria*) differs from *caesiata* in the admixture of bright golden-yellow scales on the forewing. These vary much in extent, but show themselves more or less on all the darker parts and usually encroach on the whitish subterminal line. Hindwing on an average more grey, thus with the pale postmedian band better defined. — **ruficinctata** Guen. (= obscurata Stgr.), from Scotland, has both wings much darker grey, the median band of the forewing in consequence not very distinctly differentiated from the rest of the wing. — The larva, both of the Scotch and of the continental forms, feeds on Saxifrage, but can also be reared on Sedum and other plants. It resembles that of *caesiata* but is rather more stumpy, tapering anteriorly, and the dorsal triangles are smaller. It hibernates and is full-fed in May or June. Pupa apparently similar to that of the preceding. Imago in July. Northern and Central Norway, Scotland, the Alps, Silesia and Galicia, essentially a mountain species. — **relegata** Püng. is perhaps a subspecies of *flavicinctata*, perhaps a separate species. The forewing is scarcely yellow-mixed except that the distal one-third shows some isolated yellow spots on and above the median vein; the hindwing above is lighter, almost unmarked. Koko-Nor.

C. caeruleata Guen. (9g) has sometimes been regarded as a dark form of *flavicinctata*, while STAUDINGER (quite absurdly) places it as a variety of *infidaria*; but Dr. CHAPMAN has shown from the genitalia that it is a perfectly distinct species, these organs, indeed, more resembling those of *cyanata* than of either of the last-mentioned species. It is distinguished by its dark blue-grey forewing, rather strongly traversed by dentate white lines, those which border the median area reduced to white dots on the veins, some yellow colouring

(nearly as in *flavicinctata*) on the principal bands and usually on the veins distally, but especially by its dark hindwing, without paler postmedian band but with distinct (though often interrupted) dentate white subterminal, placed on a still darker marginal band. Pyrenees. I have specimens from a dealer labelled "Maritime Alps". On an average rather larger than *flavicinctata*, at least in the ♀.

infidaria. **C. infidaria** Lah. (9 g) can be distinguished at a glance by the deep projection of the ground-colour into the middle of the proximal margin of the median band. The yellow scales, moreover, are differently distributed, being more evenly spread over the basal and median areas while in the distal area they are confined to the anterior part, sometimes almost wanting. — ab. **primordiata** Rätzer (9 g). Darker, almost without the yellow scales. Perhaps on an average smaller. Recorded from S. E. Switzerland and Styria. — ab. **nigrofasciata** Wagner. Median band of forewing deep black. Carinthia. — ab. **flavocingulata** Stgr. Forewing chalky white, weakly marked, the median band almost entirely pale ochre-yellow. Apparently the principal form in Baden and Württemberg. — ab. **hahnearia** Gmpbg., "pale greenish grey, with the median area narrow, yellow", is probably intermediate between *flavocingulata* and the name-type. — Larva similar to those of *caesiata* and *flavicinctata*, moss-grey, the dark edging of the red dorsal markings produced vertically as far as to the lateral ridge. On Saxifrage, sometimes on other low plants. Local in the mountains of Switzerland, Germany and Styria.

desperata. **C. desperata** Stgr. Unknown to me, nearest to *flavicinctata* from Norway. Forewing dirty light-grey, blackish dusted, with small dark basal area, broad dark median band and obsolete dark spots before the distal margin; a weak dark band closely follows the basal area and might almost be regarded as a part of it; the median band is broad anteriorly, suddenly narrowed (angled) behind the cell, quite narrow at the hindmargin; its proximal edge is very weakly dentate, its distal forms 2 irregular teeth; the markings of the distal area are weak. Hindwing white-grey, with traces of dark dusting towards the anal angle. Under surface very light, dirty grey-white, the median band of the forewing showing through from above. Osch, Central Asia, 1 ♀. Possibly a smaller, more pointed-winged form of *intermediaria* Alph. (PÜNGELER in litt.)

cyanata. **C. cyanata** Hbn. (9 h). The largest of the group and easily known by its light blue-grey colouring, as well as by the non-biangular discocellulars. In the typical form the paler parts are almost white. — ab. **flavomixta** Hirschke (9 h) has the pale parts of the forewing yellow. It seems to be the dominant form in the Rhaetian Alps. — In ab. **gottrensis** Favre (9 g) the median band is considerably darkened, sometimes nearly black. Described from Vallais. — The larva feeds on species of *Arabis* and probably hibernates rather small. It is short and rather stout, unicolorous greyish green, the tubercles small and black; in its earlier stages it shows also a triangular dorsal pattern. Full-fed in May. The pupa is red-brown with pointed cremaster. Imago in July, distributed in the Alps, also in the Apennines, Carpathians and extending as far as to the mountains of Bosnia and Herzegovina.

contestata. **C. contestata** Vorbr. and Müll.-Rutz is a doubtful form, founded on a ♂ and ♀ taken at Tanay by Miss de ROUGEMONT. Very near *flavicinctata*, but narrower-winged, without any yellow dusting, the ground-colour bluish (much as in *cyanata*), the lines broad (as in *caesiata*), a white streak representing the beginning of the subterminal line, the terminal line very indistinct.

bastelbergeri. **C. bastelbergeri** Püng. resembles *cyanata* and *flavicinctata* (9 g, as *flavocinctaria*) but is smaller, darker and duller than the former, the median band of nearly equal breadth throughout, the antenna not so distinctly ringed; from *flavicinctata* it differs in its rather more pointed forewing, more regularly margined central band, rather darker forewing and apparently somewhat shorter antennal ciliation. Obscure light grey, veins yellow-brownish, basal and median areas bluish grey, bordered by white lines, discal mark narrow, placed in a rather lighter costal space; apical part more strongly grey-dusted. Hindwing whitish, from the base to beyond the middle and again at the distal margin with strong grey dusting, so that only a broad postmedian band (sharply defined proximally) remains white; discal dot indistinct. The terminal line of both wings is broken into black dots, the whitish fringes are divided by an indistinct dark line. Discocellulars not biangular. Genitalia not examined. Issyk-Kul.

flexulata. **C. flexulata** (B.-Haas, M. S.) sp. nov. Possibly an *Entephria*. Discocellulars not appreciably angled, 2nd radial from their centre. Structure otherwise about as in *nebulata* (9 i). Distal margin very straight. White, thinly scaled, the markings of the forewing grey, not very strong; basal patch about as in *nebulata*, subbasal band narrow, very weak, median band of average breadth, narrowing posteriorly, its proximal edge bluntly angled on the median, distal edge anteriorly as in *cyanata*, in the middle apparently excavated, weakly defined; centre of the band white anteriorly, discal dot not very strong; distal area weakly marked, two dark spots at costa between postmedian white band and subterminal line, shorter than those of *alfacariata*; marginal paired dots sharply expressed; fringe weakly spotted. Hindwing white, with dark discal dot; terminal dots weaker than on forewing. Underside white, almost unmarked. Ispajran, Northern Alai, 3400 m in August. One ♀, in coll. PÜNGELER.

C. poliotaria *Hmps.* (13) Smaller and darker than *cyanata* (9h), the median band shaped almost as in that species, *poliotaria*. but with a slight excavation on its proximal side. Less glossy than *nobiliaria*. Forewing with subbasal band (or pair of thick lines) almost as dark as basal, nearly united with it (compare *desperata* *Stgr.*), distal area rather strongly dark-marked, in particular with the lunules of the subterminal line strongly dark filled-in proximally. Hindwing whitish-grey, almost unmarked but with a cell-dot present. Forewing beneath light grey, glossy, almost unmarked; hindwing whitish, with postmedian line indicated. Koksar and other localities in the N. W. Himalayas. Genitalia not examined.

C. uncinata *Püng.* is placed here by STAUDINGER but the shape is eccentric, more recalling that of *uncinata*. *Kyrtholitha*. Rather smaller than most species of the subgenus (especially the ♂), both wings with sharp, falcate apex, especially the hindwing. Antenna in ♂ slender, with somewhat projecting points, not ciliated. Palpus slender. Wings finely and smoothly scaled, uniform stone-grey, or in lighter specimens with the median band distally darker than the ground-colour; basal area small, little darkened; median band bounded by dentate whitish lines, which are thickened at costa; subterminal line dentate, quite indistinct; marginal line consisting of paired dark dots. Hindwing with indistinct, bent pale postmedian line. Underside grey with fine discal dots and distinct, dentate postmedian band; in lighter examples paler distally to this line. Koko-Nor. Discocellulars not biangulate.

C. nobiliaria *H.-Sch.* (9h) differs from *cyanata* in its much more glossy, darker and greyer wings. *nobiliaria*. Otherwise the coloration is somewhat similar. Discal dots obsolete. Head and face whitish. Variable in depth of colour and somewhat in the width of the median band. — **borearia** *form. nov.*, from Norway, is much *borearia*. darker. — The larva hibernates and is said to be easy to rear; PÜNGELER fed it in the autumn on rose-leaves, but it has been found wild in the spring on *Saxifraga*, among the stems, from which it can be shaken out. It varies in colour (olive green to purplish brown) and is very similar to that of *flavicinctata* but has the dorsal triangles and the lateral ridge whiter. The pupa is also very similar to that of *flavicinctata*. The moth appears in July or even at the end of June and continues, according to the elevation, until September. Only certainly known from Norway, the Alps and the mountains of Transsylvania.

C. intermediaria *Alph.* According to ALPHÉRAKY (confirmed by PÜNGELER, in litt.), this is a good species *intermediaria*. though STAUDINGER treated it as a form of the preceding. Less glossy than *nobiliaria*, the shape of the wings and of the median band recalling *caesiata* but the band more weakly expressed, not containing a pale patch near the costa as in both the allies; the pale waved lines which limit this band are straighter than in *nobiliaria*, the distal one always double; the veins are more strongly yellowish, dotted with grey; marginal dark dots are present, but weaker than in *caesiata*. Western Thian-shan, June–July. Specimens before me from Issyk-kul have the median band more parallel-edged than *nobiliaria*, though not straighter-edged and are probably the same species. — **muscosaria** *Chr.* is unknown to me and may be also a separate species. *muscosaria*. Described as a variety of *intermediaria*, larger and much darker, of a greenish fuscous colour (according to STAUDINGER leaden grey), with a series of whitish dots accompanying the postmedian distally. Founded on a ♀ from Kasbek, Caucasus.

C. neurbouaria *Ob.* (9k). Herr PÜNGELER (in litt.) refers this species to *Entephria*. It does not seem *neurbouaria*. to me very closely related to any known species and the genitalia have not been examined. Easily recognizable from our figure. Under surface brownish, the hindwing paler than the forewing; forewing indistinctly marked, a pale patch around the discal dot and a pale postmedian band the most noticeable; hindwing with dark lines rather better expressed than above. W. China and Koko-Nor.

C. nigrifasciaria *Leech* (7i) may also probably belong to this subgenus, as the texture, the shape of the forewing and the scheme of markings, besides the most important structural characters quite agree. It is only aberrant in the shape of the hindwing, which has the distal margin somewhat crenulate, and distinctly excised between the radials (rather approaching the shape of *Triphosa confusaria*). The blackish median band and blackish, deeply dentate line beyond further characterize the species. Pu-tsu-fong at over 3000 m elevation. LEECH's type remains unique. *nigrifasciaria*.

C. stellata *Warr.* (= *adjouaria* *Ob.*) (10i, as *adjouaria*) was described by WARREN as a *Glaucopteryx* *stellata*. (now *Entephria*) and may be provisionally retained here. Discocellulars strongly biangulate. A very distinct species, characterized by the olive-greenish, grey-mixed forewing, with the veins fuscous, very regularly and conspicuously spotted with bluish white; line evenly crenulate, bluish white. Ta-chien-lu. Also Sikkim (at above 3000 m elevation) and Yatung, Tibet.

Subgenus *Neotephria*, *subg. nov.* Structure and habitus of *Entephria* but with the hindwing, at least in the ♂, produced at the 1st median, 3rd radial stalked (rarely from a point) with 1st median; discocellulars not biangulate.

ramalaria. **C. ramalaria** Feld. (13a). Size and facies of *nigrifasciaria* Leech, to which some specimens bear a good deal of resemblance. Very variable, but easily recognized by the structure. Ground-colour of forewing nearly white, or yellowish-white, or pale brownish grey; the dark basal area more extended than in *nigrifasciaria*, sometimes almost uniformly dark but more commonly with the proximal part paler; median band generally somewhat narrower than in *nigrifasciaria*, or narrowing posteriorly, subterminal line not preceded by strong dentate blackish line. Hindwing white or whitish, with discal dot and dentate, somewhat angulated postmedian line. N. W. Himalayas.

antelataria. **C. antelataria** Stgr. is very similar, the hindwing less (in the ♀ not) produced, the 1st median more shortly stalked or from the hind angle of the cell. Very pale yellowish grey, the dark blue-grey median band more sharply black-edged, at least costally, where the antemedian bends sharply basewards, thus differing from that of *ramalaria*; the basal area is sharply divided into pale base and grey, black-edged subbasal band. ♂ antennal ciliation nearly as long as diameter of shaft. Zerafshan and Ferghana.

Subgenus *Coenotephria*, subg. nov. Forewing with areole double. Hindwing with discocellulars biangulate. Genitalia in ♂ without the special organ of *Entephria*.

verberata. **C. verberata** Scop. (= *rupestrata* Schiff.) (9h). Quite distinct from all other species. The ♂ is here figured. ♀ smaller and whiter, more weakly marked. — ab. *bassiaria* Feisth. (= *tenuifasciata* Höfner). Small, the median area constricted, its boundary-lines touching in the middle. — ab. *unicolor* Rbl. has the upper surface quite markingless. — *vogesiaria* Peyer. is smaller than the type, the transverse lines more yellowish, weakly expressed, the hindwing almost or quite without markings. Mountains of Alsace. — The larva has only recently been discovered by CHRÉTIEN. The egg is dropped loose among low plants, on which the larva is polyphagous. It usually hatches about March, after hibernating; but — at least in captivity — a few larvae hatch already in November. Larva moderately stout, tapering somewhat anteriorly; green with a dark green dorsal and a white ventral line. Pupa moderately elongate, yellowish brown, anal point blackish; in a slight cocoon on the surface of the ground. *verberata* is on the wing in July and is distributed in the mountains of Central Europe and the Caucasus.

tophaceata. **C. tophaceata** Schiff. (= *potentillaria* Frr.) (9h). Evidently more nearly related to the *nebulata* group than to *Entephria*, among which STAUDINGER places it. Larger than *nebulata* and *achromaria*, differently coloured with broader band, etc. Palpus rather long. ♂ antennal ciliation minute. Discocellulars variable, their angle often very weak. ♀ generally larger than ♂. — ab. *molliculata* Guen. Smaller (scarcely larger than *nebulata*), forewing rather less pointed, at apex, markings weaker, the yellowish shade wanting. — *jurassica* Vorbr. and Müll.-Rutz. Strikingly white, with more copious admixture of yellow. Recorded from several localities in the Jura. — Larva cylindrical with well marked incisions and lateral folds; grey tinged with lilac, the first 5 abdominal segments with indistinct dark V-shaped marks, filled-in with whitish. It hibernates, sometimes in the pupal cocoon. The pupa is elongate, glossy yellowish. The moth flies in July, sometimes again in September. Bilbao, the Pyrenees, the Alps, Germany and Austria-Hungary.

eteocretica. **C. eteocretica** Rbl. resembles *tophaceata* but is smaller, narrower-winged, with different colouring and with shorter palpus. The colour is more washed-out, the yellowish admixture only indicated in the marginal area, the dark costal spots before the apex much larger and more blurred, the dark marginal dashes only shortly interrupted between the veins, thus not consisting of distinct double dots as in *tophaceata*. The whitish postmedian band of the hindwing less sharply angulated. Founded on 2 ♀♀ from Assitaes, Central Crete.

viduata. **C. viduata** Stgr. is described as very similar to *obvallata*, but seems to me to belong to the present group. Wings slightly more elongate than in *tophaceata*, one more brownish, median band broad exteriorly, suddenly narrowing at the same place as in *alfacariata* but then widening again slightly; the broad costal half contains a pale patch and small dark discal dot; distal area more weakly marked than in *tophaceata*; margin with pairs of small black dots. Hindwing light, the postmedian line (as in most of the group) sharply angled, very faint above, more distinct beneath. Both wings beneath with dark costal spot at origin of this line. Antennal ciliation nearly as in *nebulata*. Discocellulars very weakly (sometimes scarcely) angulated. Issyk-Kul and the Ili district, etc.

neogamata. **C. neogamata** Püng. Rather smaller and more pointed-winged than *viduata*, more glossy, more brownish, basal patch and median area darker, the latter similarly shaped but with less strong teeth and indentations; postmedian line of hindwing marked with darkish dots on the veins from 3rd radial onwards. Antennal ciliation longer. Discocellulars more strongly biangulate. Ferghana and the Ili district.

C. fortificata B.-Haas. Only one example known, possibly related to the three preceding. Pure white with brownish black basal and median bands, the latter — as in them or even as in *albigirata* — narrowing very abruptly in the middle, but with its broad anterior part differently shaped, its edges more excavated in and opposite to the cell, etc. Juldus district. Probably a rare form, analogous to *caesiata* ab, *prospiciuata* etc., but does not seem referable to any known species. The structure is not indicated. *fortificata.*

C. egenata sp. nov. Still narrower-winged than *neogamata*, the markings nearly as in that, the edges of the median band less proximally curved at costa; colouring more as in *viduata*; distal area very weakly marked, only with quite ill-defined costal patch. Both wings beneath very weakly marked, the postmedian line less acutely angled than in the two preceding. Structure as in *neogamata*. Siberia; Irkut River. *egenata.*

C. nebulata Tr. (9 i). Whitish cinereous or slightly brownish (our figure a little too brown), the basal and median darker areas not very strongly expressed, best defined at their margins, especially on the costa. Hindwing somewhat greyish proximally, the boundary sharply angled (not brought out in our figure), then white, then again greyish (though often quite weakly). Underside also weakly marked, the hindwing whiter than above but with a more distinct, angled postmedian line and often a rather distinct, though small discal dot. Head and face white. ♂ antennal ciliation almost as long as the diameter of the shaft. — **vallesiaria** Lah. (= *mixtata* Stgr.), from Vallais and the Tyrol is darker grey, more tinged with fuscous. Probably our figure should be referred to this form rather than to the type, but various gradations occur. — Larva smooth, of medium proportions, light reddish grey, paler beneath, the first 5 abdominal segments dorsally each with a small black spot followed by 2 dots; head small, light. Feeds on Galium in July-August, spins up in September, but hibernates as a larva in the pupal cocoon, changing in the spring. The pupa is compact, yellowish brown with long cremaster. The moth flies in June-July, a partial second brood late in August. Local in the mountains, Jura to Dalmatia; also recorded from Gran Sasso, Central Italy. *nebulata.* *vallesiaria.*

C. approximata Stgr. Nearly related to *nebulata* (9i), possibly a variety of it. Not such a clear grey as *nebulata*, more greenish, but not so dark as *vallesiaria*. Less sharply marked, the median band only darkened distally, here anteriorly rather sharply bounded by a whitish green band; distal marginal dots distinctly disposed in pairs; fringe yellowish proximally, whitish distally. Underside darkened, the median band about as in *nebulata*; distally to it are placed at the costal margin three light parallel stripes, reaching to the apex, which are wanting in *nebulata*; the postmedian line of the hindwing appears somewhat less dentate and is followed by two rather distinct dark lines, which also are wanting in *nebulata*. N. E. Asia Minor and Transcaucasia, May—June. — **impunctata** Stgr., founded on a single ♀ from Amasia, is perhaps a mere aberration, rather weakly marked and entirely without marginal dark dots or line. Examples from Tien-shan and Merv probably belong here. — **propagata** Chr. may be a local race of *approximata*, rather larger and darker. Transcaucasia and Transcaspia. *approximata.* *impunctata.* *propagata.*

C. achromaria Lah. (= *saxicolata* Led., *hispalata* Rbr.) (9i). Very similar to *nebulata* but more sharply marked, especially as regards the central band and the under surface; distal edge of central band on an average more deeply indented at 2nd radial and at 2nd median. ♂ antennal ciliation shorter. Head and face white irrorated with grey. The larva is also very similar to that of *nebulata* but is of a bluish grey colour, with the dorsal pattern much more sharply prominent and with black spots below the 3rd—6th spiracles. It feeds on Galium in June and again in September, the 2nd brood hibernating in the pupal cocoon. Pupa similar to that of *nebulata*. Imago in May—June and a partial 2nd brood in August. Local in the mountains from the Pyrenées and Alps to Greece. *achromaria.*

C. incultaria H.-Sch. (= *latifolia* Mill.) (9h) is distinguished by its small size and rather elongate glossy wings. Clear grey or slightly brownish grey, the markings rather weak or moderately well expressed, the lines which bound the median area darkened costally; median area rather narrow or of moderate width; the narrow double bands which bound it white, clearest costally. Hindwing almost or altogether unmarked. Head white. ♂ antennal ciliation very short. The larva is rather stout, pale green, dorsal and subdorsal lines darker green, lateral stripe broad, very pale green, washed in the centre with more or less bright carmine; head small. It feeds in the seed-vessels of *Primula latifolia* or mines in the leaves; sometimes also in the seeds of *Saxifraga* or *Bartsia*. Pupa yellow-green, with darker wings, hibernating in an earthen cocoon. Flies in June and July in the Alps, Carpathians and the high mountains of Bosnia. *incultaria.*

C. lamata Stgr. is unknown to me, but its author says that it would be perhaps least inappropriately placed next to *numidiata*. As the ♂ antenna is merely very shortly ciliated, it is evident that the position assigned in his Catalogue (following *ferrugata*) is incorrect. Forewing dirty grey-brownish, with 3 narrow, white-bordered dark bands, dark discal dot, a dark apical line or dash and dentate white subterminal line; antemedian band close before the discal dot; postmedian outcurved; sometimes these two bands are confluent, *lamata.*

forming a single median band which is only somewhat lighter around the cell-dot; the apical dash is more conspicuous than in any allied species; terminal line black, interrupted at the veins; fringe with dark dividing-line and dark chequered. Hindwing dirty grey, with narrow, curved lighter postmedian band. Uliassutai.

numidiata. **C. numidiata** Stgr. Very similar to the following species but darker, greyer, the basal patch and median band of the forewing more definitely darkened, the latter generally not so narrow at its posterior end. Under surface also darker (though paler than above) and decidedly more sharply marked. I can find no difference in the structure. STAUDINGER thought it not impossible that it might prove a mere local race of *alfacariata*. Algeria and Teneriffe; one recorded also for Murcia.

alfacariata. **C. alfacariata** Rbr. (= *ibericata* Stgr.) (13a). On an average somewhat smaller than *nebulata*, the ground-colour entirely different, being of a light brownish grey, the median band somewhat differently shaped, strongly narrowed and more or less darkened at the hindmargin. The distal area of the forewing, the hindwing and the entire under surface are weakly marked. Head concolorous with wings; antennal ciliation in the ♂ about as long as the diameter of the shaft. S. Spain, N. Africa and Palestine.

mongoliata. **C. mongoliata** Stgr. is described as very similar to *alfacariata* and possibly a Darwinian form of it. Rather larger, of a less brownish grey, with the markings darker than in *ibericata*; particularly noticeable are two narrow, wavy, leaden-grey or blackish grey bands (the antemedian and postmedian), which never quite unite on the hindmargin but remain separated by the lighter ground-colour; distally to the postmedian stands at the costal margin the beginning of a dark macular band, which is only slightly indicated in *alfacariata*. Under surface darker, more grey than yellowish-brown, the angled postmedian line on the hindwing more distinct. Uliassutai district. The description does not mention how it differs from *numidiata*, excepting in size; perhaps still less brownish.

reclamata. **C. reclamata** sp. nov. (13o). Larger than *alfacariata* (33—35 mm, English measurement), narrower-winged, also distinguishable at a glance by the presence on the forewing of an elongate dark discocellular mark; the dark line which bounds the basal patch forms a distinct projection in the middle, angled before and behind the median vein; median band variable in width, in the type narrow, in all examples — as in the allied forms — much narrower posteriorly than anteriorly; distal area with a slight dark suffusion but very weakly marked, in the type with indications of two thick lines between the pale postmedian band and the (obsolete) subterminal; no distinct dark spots between the radials. Underside very pale and weakly marked. Antennal ciliation in ♂ long. Schahkuh, Persia (E. FUNK), type ♂ in coll. PÜNGELER. "Syria" 1 ♂, 1 ♀ in coll. Brit. Mus.

senectaria. **C. senectaria** H.-Sch. (9i) probably belongs to this group, but I have no material available for comparison. It is distinguished by its elongate wings, weak markings (the hindwing in the ♂ almost entirely unmarked), long antennal ciliation in the ♂, etc. Forewing dull grey, more or less mixed with clay yellowish, the median band somewhat darker, distally without any strong projection in the middle but somewhat constricted posteriorly; the subterminal line hardly marked; distal margin with short blackish streaks. Underside whitish grey, almost without markings, a very weak cell-dot and postmedian line indicated. Istria, Fiume and Dalmatia in April and September, found resting on rocks or attracted to light, but local and scarce.

ludificata. **C. ludificata** Stgr. Forewing grey mixed with yellowish (sometimes lighter and more sand-coloured), traversed by a number of lines almost exactly as in *dissimilata* Rbr., but with paired terminal dots as in *frustata*; the subterminal consists (at least posteriorly) of a series of separate white dots. Hindwing above grey, becoming whitish towards the base, without any trace of discal dot but with a dark, strongly angled postmedian line; distal area somewhat darkened, showing in some specimens a dentate subterminal line. Both wings beneath with discal dot and with a postmedian line, that of the forewing only distinct anteriorly, that of the hindwing broken up into vein-dots. Antennal ciliation in the ♂ nearly as long as the diameter of the shaft, thus much longer than in *frustata*, etc.; anal clasps strongly developed, so that STAUDINGER formerly

decipata. referred it to LEDERER's group Aa. Greece. — **decipata** Stgr., the commoner form, has the forewing more greenish grey (less brown) and almost entirely without yellowish irroration. Central Italy and Greece to Mesopotamia.

kalischata. **C. kalischata** Stgr. Narrower-winged than *ludificata*, forewing with distal margin more oblique, rather more curved, hindwing with distal margin very strongly rounded. More glossy, median band shaped about as in *scripturata*, more sharply defined, discal dot conspicuous in a pale space, terminal line consisting of lunules at the vein-ends, thus concave inwards. Hindwing grey with curved whitish, divided postmedian band. Andalusia and Murcia.

C. flavistrigata Warr. (7 h). Also glossy, smaller than the preceding group, forewing with apex more *flavistrigata*. acute, distal margin straighter, band darker, differently shaped; a characteristic yellow shade along median vein and before subterminal line. N. W. Himalayas (Darmsala etc.).

C. minuta Btlr. (7 h) is considerably smaller still than *flavistrigata*, the ground-colour of the forewing *minuta*. whiter, the median band rather broader, the yellow shade wanting, etc. Hindwing with distal margin prominent at 3rd radial, slightly concave from here to 2nd subcostal. Forewing beneath more weakly marked; hindwing somewhat paler than above, at least in its distal half, a dark spot near the hinder angle distinct. Dharm-sala. Also Sikkim and Tibet.

C. hockingii Btlr. (7 k) is another very small species, resembling a *Perizoma* except in the tufted face *hockingii*. and long, rough palpus. The median band may perhaps best be compared with that of *blandiata*, but the ground-colour is more yellowish, the markings less blackish brown, the distal area much less regularly darkened. Hindwing generally more weakly marked than in our figure, the black dotted line often nearly obsolete. Dharmsala. Also in Sikkim.

C. lacernigera Btlr. resembles *hockingii* in structure and colouring but is on an average rather smaller *lacernigera*. still, the median band narrower, fainter, scarcely at all widened and not at all darkened anteriorly, the dark costal spot before the subterminal, on the contrary, more sharply defined. Dharmsala. Also at Simla.

C. debilitata Leech, of which only a single example (♀) is known, is probably related to *amelia*, but *debilitata*. larger, paler. the lines of the forewing only represented by vein-dots, the postmedian remote from the ante-median; a dark discal dot, faint traces of median shade midway between it and the subterminal; a weak apical streak. Gifu.

C. evanescens Stgr., founded on a single worn ♀ from Vladivostok, may possibly be also related to *evanescens*. *amelia*. Thinly scaled, light yellow-grey, the forewing with a somewhat darker, moderately broad median band and a small dark discal dot.

C. amelia Btlr. (10k) approaches *malvata* in structure, but the palpus is rather longer, the *amelia*. wings on an average even broader, forewing lighter, more yellowish brown, median band broader, the other markings weak, the hindwing whiter. Japan: Yokohama, etc. The centre of the median area varies, commonly showing larger or smaller pale spots or even a continuous narrow band.

C. mediolineata spec. nov. (13 c) is perhaps an extraordinary form of *amelia* or of *debilitata*; intermediate in *mediolineata*. colour; size of a small *amelia*; antemedian line of forewing weak, gently curved, followed by faint traces of 2 other lines; median line fine, distinct, crossing the discal dot, straight excepting a slight proximal curve at costa and slight distad curve at hindmargin, the succeeding area darker nearly to the postmedian line, which is placed as in *debilitata*, but straighter, continuous, scarcely denticulate. Japan: Owakidana, near Myanoshita, type ♀ in my collection, presented by Dr. M. CULPIN.

C. malvata Rbr. (9k). A variable species, of which we figure two of the principal forms. In its robust *malvata*. build, the shape of the wings and the presence, in some examples, of a dark oblique dash at the apex of the forewing it bears a good deal of resemblance to the genus *Ortholitha*. Forewing brown, usually with a reddish tinge. Hindwing paler, very weakly marked. Dark aberrations commonly show a very characteristic white dot or spot distally to the cell of the forewing. — In ab. *catenaria* Rbl. some further white spots are developed *catenaria*. posteriorly. — Face without projecting cone of scales. Palpus stout but rather short. Antennal joints in ♂ angularly projecting, ciliation minute. Larva moderately slender, green when young, later brownish, with dark dorsal triangles; ventral surface dirty white. Feeds on Malva and Lavatera, hibernating. Pupa conical, rather short, thick, reddish, with the cremastral hooks black. It remains in this stage a good part of the year, the perfect insect appearing in September. S. France, Spain, Sicily, N. Africa and at Lissa, Dalmatia.

C. tripunctaria Leech (7k) is probably not less variable than *malvata*, but only two examples are yet *tripunctaria*. known. ♂ antennal ciliation longer, wings slightly narrower. Forewing dark brown, brighter ferruginous brown distally to the postmedian line, the basal and median areas bounded distally by white lines, the median containing in its middle two white spots, which very greatly in size and may probably sometimes be wanting, as in the closely allied (perhaps not separable) Indian species *combusta* Swinh. Hindwing whiter than in *malvata*. Under surface with the postmedian line, as also on the hindwing the median, represented by rows of dots. W. China: Pu-tsu-fong, taken in June.

C. umbrifera Btlr. (10i) differs from *tripunctaria* in having almost the whole of the median area of the *umbrifera*. forewing white, the postmedian line more irregular, more dentate, arising from a triangular, sometimes fuscous

costal spot; distal area generally rather paler, the large pale spot in its centre sometimes less well defined. Apparently not variable. Japan; Yokohama; Korea; Gensan; Central China: Chang-Yang. Also known from the Khasia-Hills.

erebearia. **C. erebearia** *Leech* (13 c) is a glossy species of uncertain affinities. The coloration of the forewing rather recalls that of dark specimens of *Philereme voshti* but the hindwing is narrower, smooth-margined. Perhaps it should form a new subgenus near the beginning of *Cidaria*, as the ♂ genitalia are strongly developed. Face without cone, palpus rather short and stout, ♂ antenna pubescent, discocellulars strongly biangulate. Forewing glossy-brown-grey with an admixture, in the paler parts, of shining, light blue-grey scales; about 15 black-brown lines traverse the wing, those which bound the basal and median areas thickened; white subterminal line only distinct at costa, accompanied by some dark spots. Hindwing with a single, rather weak curved line. Underside with numerous lines, on the forewing weak. Pu-tsu-fong.

obsoletaria. **C. obsoletaria** *H.-Sch.* (= *alpicolaria* *H.-Sch.*, *gentianata* *Mill.*) (10 a as *alpicolaria*). The markings very distinctive, the small basal patch of the forewing being closely followed by a broad dark bar, while the median band, which becomes narrow and distinct at the hindmargin, is almost obliterated. Face without projecting cone of scales. Antennal ciliation minute. The larva feeds in the unripe capsules of *Gentiana lutea* and other gentians and according to DE ROUGEMENT dies if they are opened; it is short and thick, flesh-coloured with strongly developed tubercles and dark brown prothoracic and anal plates, altogether recalling a Tortricid larva. August–September. The pupa is also short and thick, reddish yellow, with short cremaster. Imago in June and July in the Alps, the Tyrol and Southern France. On account of the biology it should perhaps be referred to the *Perizoma* group.

perplexata. **C. perplexata** *Leech* has the median area broader, more brightly brownish, less interrupted, the succeeding band purer white in its anterior half, the apex anteriorly to the oblique apical dash white, the hindwing white with more distinct lines, the underside more sharply marked than in *obsoletaria*. Ta-chien-lu.

casearia. **C. casearia** *Const.* (13 c). Forewing creamy white; subbasal line thick, blackish (especially at its edges), with a projecting tooth in the middle; median area hardly darkened, broader anteriorly than posteriorly, bounded by two angular, deeply dentate grey bands which are darkened into quadrate blackish spots costally; discal dot small and indistinct; distal area shaded with the same colour as the two bands, subterminal line zigzag, white. Hindwing very pale grey with a postmedian series of blackish vein-dots, followed by a pale band; subterminal not zigzag. Fringes dark chequered, especially on the forewing. Corsica, found at rest on the stems of *Alnus suaveolens*.

ambustaria. **C. ambustaria** *Leech*. Somewhat similar to the species which follow and apparently similar in structure except that the discocellulars of the hindwing are only very weakly biangulate. Size much smaller, coloration about as in weakly marked *taczanowskiaria*, antemedian line less oblique, nearly straight (slightly curved), subapical streak not well defined but merged in a dark cloud of which it forms the anterior edge and which reaches to the 3rd radial. W. China, perhaps also from Koko-Nor.

taczanowskiaria. **C. taczanowskiaria** *Ob.* (= *pervagata* *Chr.*) (10 m). Brown-grey with some tinge of reddish. Forewing similarly coloured and marked to that of *rejectaria*, but *taczanowskiaria* is rather longer-winged, the antemedian band somewhat straighter, postmedian line deeper black, the band proximally to it rather broader and darker, the projection on the 1st radial less sharp, the subterminal line much less dentate. The abdomen is built more like that of *Pelurga comitata*. ♂ antennal ciliation extremely minute. Palpus strong. Rather variable in the lighter, brighter or darker colour. Amur, Ussuri and Japan.

rogata. **C. rogata** *Stgr.* In size, colour and markings, as well as structure, similar to *berberata*. Subbasal stripe not bent on subcostal vein; antemedian weakly curved in S-shape, usually preceded by two blackish lines; a short discal lunule sometimes present; postmedian almost straight, only extremely weakly curved and with one or two quite small teeth distad near the costa. Hindwing usually with a broad, noticeably darkened distal border. Ferghana.

rejectaria. **C. rejectaria** *Stgr.* (= *interrogata* *Alph.*). Closely related to *berberata*, of which it may be a Darwinian form. Rather darker, less variegated, the black lines of the forewing finer and less intense, the postmedian forming a less acute tooth on the 1st radial, the lines proximally to it closer together, more suggesting a narrow band, which continues, more or less fully developed, to the hindmargin; subterminal line more distinct. Underside of forewing dark glossy grey, costal margin to beyond the middle pale, discal dot and costal part of postmedian line distinct; hindwing paler, with discal dot, postmedian line and a weak dark shade beyond. Issyk-kul, Thian-shan and Amdo.

C. lasithiotica *Rbl.* is also closely related to *berberata*, doubtfully distinct. It may be known by the entire absence of reddish in the coloration of the forewing and the more complete markings. The transverse stripes are blackish brown (not red-brown), the antemedian broad, more strongly sinuous, the light median area itself narrower, its distal boundary more sharply expressed; the white subterminal line is very distinct, its proximal dark edging towards the costa not united with the black apical streak; the fringes are sharply dark spotted at the extremities of the veins. The hindwing sometimes shows a distinct waved white subterminal line. The under surface is also more sharply marked than in *berberata*. *lasithiotica* was discovered in the mountains of Crete. Specimens from Granada (June, August) seem still nearer *berberata*. *lasithiotica*.

C. berberata *Schiff.* (10 m). Easy to distinguish by the form of the postmedian, the rather long, in part thickened but somewhat interrupted apical streak, etc., coloration more brown than in the two preceding. Underside rather pale, forewing with subbasal costal spot usually very conspicuous, both wings with discal dot and postmedian line, the latter most distinctly marked on the veins. ♂ antennal ciliation very short. — ab. **elutata** *Favre* is a washed-out form in which the median area is represented by two lines which meet at the costa, the postmedian then describing a circle, a sinus and finally some undulations. "Here and there among the type" (*Favre*). I have seen nothing like it. — Ab. **semifasciata** *ab. nov.* is a very remarkable form in which the median area of the forewing is much narrowed and in its anterior part contains a narrow dark band, which posteriorly becomes reduced to a mere line. Figured by *BARRETT*, *Lep. Brit. Isl.* vol. 8, pl. 344, f. 2. — ab. **hellwegeri** *Rbl.* has the median area unicolorous black-brown. — ab. **schultziaria** *Heider* has the ground-colour of the forewing uniform brown, the median area not paler; hindwing also darkened. — Larva short, stout and rugose, with raised transverse skin-folds and well developed tubercles; variable in colour, some shade of grey or brown, sometimes with whitish lateral spots; fine longitudinal black lines and dark transverse stripes. On *Berberis vulgaris*. The pupa is short and stout, yellowish-brown, with short knobbed cremaster. The moth appears in two generations, in May and August, and is widely distributed in Central-Europe, Asia Minor, Transcaucasia, the Altai, etc. *berberata*. *elutata*. *semifasciata*. *hellwegeri*. *schultziaria*.

C. consanguinea *Btlr.* (= *directaria* *Graes.*) represents *berberata* in Japan and Amurland. It is more uniform reddish grey, the subbasal and antemedian lines straight, oblique, parallel, rather nearer together than in *berberata*, the median area not or scarcely lighter in its central part than the rest of the ground-colour, the subterminal line wanting. *consanguinea*.

C. derivata *Schiff.* (= *nigrofasciaria* *Goeze*, separata *Thnbg.*) (10 m) differs from all the other species in the extraordinarily strong projection of the outermost line of the median area. The markings are well shown in our figure. — ab. **ludovicata** *Mill.* has almost the entire median area darkened so as to form a central band. Larva long and slender; head small, flattened, purple-red; body bright green with purple-red dorsal line on thorax and last 3 segments; legs purple-red. On wild rose, May—July. Pupa slender, red-brown with the wings more green, hibernating in an earthen cocoon. The moth appears in April and May and inhabits Central Europe, Russia, Transcaucasia, Altai, the Ili district, etc. *derivata*. *ludovicata*.

C. querulata *Püng.* is smaller and narrower-winged than *derivata*, greyer and more uniform in tone, with less irregular postmedian line; the latter rather recalls that of the *berberata* group but *querulata* lacks the dark apical streak which is present in that group. Forewing ash-grey tinged with brownish, median area broad, subterminal line only indicated at costa, terminal fine, fringe dark-chequered. Hindwing greyish, somewhat darker distally, postmedian line not so deeply angulated as in *derivata*. Both wings beneath with fine discal dot and postmedian line; forewing with a small dark spot near base of costa. Korla. *querulata*.

C. alhambrata *Stgr.* (10 m) is again easy to recognize on account of its small size, relatively long costal margins, straight distal margin of forewing, nearly straight subterminal line, etc. Under surface weakly marked. Granada and Murcia, September—October, also in larger examples from Algeria. *alhambrata*.

C. adlata *Stgr.* (9 i). Affinities uncertain, possibly near the preceding. A black apical streak is not shown in our figure. ♂ antenna subdentate; discocellulars weakly biangulate. ♂ genitalia almost as in the first subgenera of *Cidaria*. Underside with small discal dots and a slight subapical darkening at costa, otherwise very weakly marked. Syria and Palestine. *adlata*.

C. sagittata *F.* (= *bidentata* *Hufn.* nec *L.*, *comitata* *Hbn.* nec *L.*) (10 m). Forewing bright fawn-brown with rather narrow, white margined basal and median bands, the latter with extraordinarily strong distal projection in the middle, which at once characterizes the species; a white longitudinal streak follows the projection at the distal margin. — ab. **interrupta** *Hirschke*, with the median band interrupted with white at the fold, is the only known aberration. — Larva short and stout, light green with strong dark green transverse ridges and interrupted lateral line. On seeds of *Thalictrum*. Pupa short and thick, green; hibernating. Local in Central and Eastern Europe and in S. E. Siberia and Japan, flying in June and July. *sagittata*. *interrupta*.

costinotaria. **C. costinotaria** *Leech* (13 c) is much more glossy than *sagittata*, of a darker, less yellowish fawn-colour (in places greyish shaded), the distal area more grey, the median band sharply broken off at the 3rd radial, the white markings less pure. Antennal ciliation rather longer — nearly as long as diameter of shaft. Pu-tsu-fong, only the type ♂ known. Closely related to *olivacea* *Warr.* from Sikkim.

fractifasciaria. **C. fractifasciaria** *Leech* (7 i) is at once distinguished from *costinotaria* by its white ground-colour, broader costal patch, with a slight projection behind the 3rd radial, by the presence of a further small spot on the hindmargin, the more continuous white subterminal line, not forming any longitudinal wedge-shaped projection in the middle, and other differences. Wings equally glossy, rather narrower; antenna rather thickened, with very short ciliation. The type ♂ was taken N. W. of Ta-chien-lu. I know no other examples.

Subgenus *Euphyia* *Hbn.* Face commonly with cone of scales. Antenna in ♂ nearly simple. Areole double. Discocellulars not biangulate (but see *subochraria* and *chimakaleparia*). Probably contains some heterogeneous elements, but does not at present seem subdivisible.

sintenisi. **C. sintenisi** *Stgr.* is said to resemble *frustata* except that the colour is much darker, leaden grey, not green or yellow and the underside quite different, the dark discal dot being followed by a narrow light band which on the hindwing is sharply limited by a darker line while on the forewing it is indistinct in its posterior part; the white subterminal line, which is generally conspicuous in *frustata*, is extremely faint in *sintenisi*, almost wanting in the posterior part of the forewing, the whole hindwing and on the underside. The type specimen shows three short whitish stripes in the apical part of the forewing. Hindwing dark grey, the distal area broadly darker still. Forewing beneath with some whitish spots close to the distal margin, one in the middle, one at the apex. Structure as in *frustata*. N. W. Kurdistan and Transcaucasia.

adumbraria. **C. adumbraria** *H.-Sch.* (12 c) superficially resembles on the upper surface a large *nebulata* but is slightly broader-winged, with a considerably broader median band, the lines of which it is composed thickened at the costa, the whitish band which follows it more distinct, the postmedian line of the hindwing placed nearer to the distal margin and a discal dot present on this wing. Under surface sharply marked, grey as far as the postmedian line (which is angled on the hindwing), then with a whitish band, the distal area again dark, marked with a conspicuous row of white interneural dots, which are sometimes connected by a fine white line; fringes dark-spotted. Antenna in the ♂ with extremely short ciliation. Not variable, though the markings in some examples are a little more strongly expressed than in others. Apparently double brooded, being on the wing at the end of June and in July and again in September. Croatia, Dalmatia, Herzegovina, Taurus and N. Syria.

frustata. **C. frustata** *Tr.* (= *muscosata* *Donz.*) (9 k) is quite unmistakable on account of its mossy green forewing (fading to dirty yellowish with age), paler-centred median band, which contains a large discal dot, grey hindwing, etc. — **C. fulvocinctata** *Rbr.* is a form in which there is a strong admixture of golden-yellow scales especially on the veins in the distal area and at the costal end of the bands. It is recorded from Andalusia, the Alps, Central Italy and Hungary, sometimes together with the type, sometimes replacing it. — Larva rather stout, pale clay-colour with a reddish tinge; thoracic segments with dark dorsal and subdorsal lines, middle segments with a cross-shaped pattern. On Galium. The pupa hibernates. Double-brooded (except in the mountains), April—May and again in August. S. France and Italy to Austro-Hungary; Asia Minor; Transcaucasia.

sandosaria. **C. sandosaria** *H.-Sch.* (= *bertrandi* *Roths.*) (9 k) is variable; normal specimens somewhat recall, in the weakly marked distal area and hindwing, *C. alfacariata*, but the ground-colour is less glossy, generally brighter and deeper ochreous brown or reddish, the median band broader and of more uniform width, thus much broader at the posterior margin than in that species. Hindwing grey, often lighter than in our figure. Under surface rather weakly marked. S. Spain, S. Algeria and Tunis.

intersecta. **C. intersecta** *Stgr.* (9 i, misprinted *internata*). A rather soberly coloured species, but not difficult to recognize. The wings are shaped much like some *Horisme*; the strongly spotted costal margin of the forewing is also noticeable. Ground-colour light greenish grey or yellowish grey, the transverse lines indistinct, chiefly marked by dots on the veins, a pale subterminal band better marked. The right forewing of our figure is correct, the left faulty. Both wings beneath with indistinct, not angled postmedian line. Mongolia. — **C. desiderata** *Stgr.* has the wings more reddish-brown in colour. Issyk-kul. — **C. expansata** *subsp. nov.* is more whitish grey; the median area much broader, antemedian line scarcely so oblique, postmedian projecting more at 1st radial and between 3rd radial and 2nd median, discal dot very conspicuous; hindwing with postmedian similarly formed. Askhabad, Transcaspia, both sexes in coll. PÜNGELER. Perhaps a separate species.

scripturata. **C. scripturata** *Hbn.* (= *placidaria* *Frr.*) (9 k). Generally not variable except in size. The pale ground-colour will at once separate it from the few other species in which the entire wing (except a distal border)

is traversed by parallel lines of almost equal strength. The under surface is less uniform, most of the lines being weak, the postmedian strong, the band which follows it paler than above. — *dolomitana* *Habich* is an *dolomitana*. interesting local form from the Southern Tyrol with the ground-colour, especially in the median area, dark grey. — The larva is rather stout, with fine black dorsal line, narrowly edged with yellow-green, and a broad, dull black subdorsal; ventral surface yellow-green with 5 blackish lines. It feeds on low plants and hibernates. Pupa light brown, the wings lighter. The moth flies in June and July and is common in the Alps, the Carpathians, etc.; local in S. W. Germany.

C. filaria *Ev.* Concerning this doubtful species we have no information beyond the original description *filaria*. (as *Acidalia*) and a note by ERSCHOFF that it is "a *Cidaria* near *riguata* *Hbn.*". About the size and shape of *malvata*. Fawn-colour; forewing somewhat shaded, with 4 fine oblique, curved, irregularly dentate white lines, the first 2 incurved near the costa, the third with the deepest curve in its middle, the fourth parallel with the distal margin; a brown discal dot. Hindwing with 2 white lines parallel with distal margin, continuing the last two of the forewing. Underside grey brownish with a brown postmedian line and a very indistinct whitish subterminal. Zaisan.

C. cupreata *H.-Sch.* (= *hortulanaria* *Stgr.*, *indecora* *Warr.*) (9i). Face with well developed tuft. *cupreata*. Antenna in ♂ somewhat thickened, with ciliation minute. Very variable; the coppery hue, as shown in our figure, is typical, but darker, less reddish-tinged forms also occur. Median band of forewing broad, its proximal edge strongly curved, running very obliquely basewards in its posterior part so that the band is relatively broader on the hindmargin than is usual in *Cidaria*; a whitish line or patch follows the band in the anterior part of the wing and there is commonly an oblique pale shade from the apex; two blackish spots between the radials, sometimes lost in a dark subapical cloud. Hindwing always weakly marked, with crenulate black marginal line. Underside paler, weakly marked. S. Spain, Sicily, N. Africa, Asia Minor and Syria. "Amur", assigned by a dealer as locality for WARREN's type, is no doubt erroneous. — **confuscaria** *Stgr.* (= *bistrigata* *confuscaria*. *H.-Sch.* nec *Tr.*) is probably, as STAUDINGER suggests, a sharply-marked aberration, more yellowish brown, the median area strongly fuscous edged, its central part anteriorly yellowish, posteriorly violaceous. Sicily. — **palaestinensis** *Stgr.* is a dark grey (scarcely brownish tinged) race from Palestine, but also occurring in *palaestinensis*. N. Syria and N. Africa.

C. vallantinaria *Ob.* (9k) is probably nothing more than an aberration of *cupreata* with the band *vallantinaria*. narrower, differently shaped proximally, the ground-colour more mixed with olive grey, etc. The name may have to supplant *palaestinensis* for the Syrian and North Africa race, but I hesitate to unite them as STAUDINGER regarded OBERTHÜR's type as representing a distinct species and OBERTHÜR mentions a triangular blackish apical patch on the forewing beneath. Algeria: Bône, one ♂.

C. obvallata *Led.*, described from a single ♂ from Astrabad, is unknown to me. LEDERER says that *obvallata*. it bears a superficial resemblance to a worn *munitata*, but the size is somewhat larger and the wings, according to the figure, somewhat more elongate. Forewing pale reddish grey with basal patch and median band reddish brown traversed by dark lines; discal mark present, strigiform; distal area weakly shaded with reddish brown, the subterminal line indistinct. Hindwing and underside paler, with indistinct whitish postmedian band; discal dots present, also on the underside an obscure dark line proximally to the pale band. ♂ antenna shortly ciliated.

C. basochesiata *Dup.* (10a). The pleasing varied reddish grey shades of the forewing, whitish hindwing *basochesiata*. with somewhat crenulate blackish terminal line, the peculiarly shaped antemedian line and the dark shading which follows it distally except at the angle are among the principal distinctive features. Both wings beneath are pale brownish grey, with discal dot and fine, sinuous postmedian line. Probably related to *cupreata*. Larva moderately elongate, cylindrical, tapering somewhat anteriorly; dorsally pale brown, shaded with blackish on the sides; venter yellowish grey; dorsal line dark, subdorsal fleshy white, washed with yellowish; spiracular line pale, interrupted; spiracles ovoid, very small, orange, broadly ringed with black. On *Rubia peregrina*, feeding up rapidly, even in the winter. The moths usually appear about 20—25 days after pupation, namely in the autumn, winter and early spring; but as soon as the hot weather commences they cease to emerge, some of the pupae therefore aestivating. A very local species, only known from S. France, Spain and Sicily.

C. latifasciaria *Leech* (13c) somewhat recalls *badiata* except in shape, but the median band is still nearer *latifasciaria*. in form to that of the Indian *lateritiata* *Moore*, with which it further agrees in the rounded, not tufted frons and shortish palpus, but which has biangulate discocellulars, narrower white hindwing, etc. Both wings broad, distal margins rounded, weakly subcrenulate. Forewing violet-grey with light copper-brown basal patch and median band, the former oblique-edged (widest anteriorly), traversed and bounded by darker lines, the latter broad, of pretty equal width throughout, but sinuous-edged, indented near the costal margin and with short

double rounded projection between 3rd radial and 2nd median; proximal edge of this area forming a narrow fuscous bar (or thick line) nearly throughout, distal edge forming a similar one between the radials; the band, except a rather narrow central part, is traversed by darker lines, as are also the violet-grey areas; discal mark elongate; subterminal line indicated by a white dot behind the 3rd radial; a dark apical streak. Hindwing uniform glossy violet-grey, a postmedian line scarcely indicated. Both wings beneath like hindwing above, the forewing more coppery-tinged costally. Wa-shan in May, only the type known (a ♀). Possibly the ♂ will prove to have pectinate antenna like *pendearia* Ob., to the darkest examples of which it superficially approximates.

- putridaria.* **C. putridaria** H.-Sch. HERRICH-SCHÄFFER figured two very distinct species under this name, as ♂ and ♀ and as the *male* (fig. 535) belonged to the species later named *acutangulata* by CHRISTOPH it would have been more reasonable to restrict the name to that; but as the "first reviser" (STAUDINGER) restricted it to the female (fig. 536), his action must be followed; perhaps even HERRICH-SCHÄFFER's description (vol. 6, p. 78) favours this view. Whitish grey with a slight tinge of brownish, the median area only darkened at its margins, the distal area without the red-brown blotches which characterize the following species. Except in its rather larger and less white colour it scarcely differs from *bulgariata*. Chiefly known from Transcaucasia, N. Persia and Transcaspia. —
- bulgariata.* **bulgariata** Mill. (10a, as *permixtaria*) is the European form, first described from Bulgaria but also occurring in Herzegovina, Italy and at Digne, probably also in Western Asia. Larva slender, green with fine dark dorsal and white subdorsal lines, lateral area puffed, broadly shaded with yellowish below. July—August on Galium. The pupa hibernates and is dull brown, anteriorly greenish. Imago in June.
- permixtaria.* **C. permixtaria** H.-Sch. (10a, as *putridaria*). Very like the preceding, abdomen with stronger pairs of black spots, distal area of both wings whitish behind the 3rd radial, forewing with red-brown spots proximally to the subterminal. Altogether a more sharply marked, more variegated species. Spain, S. Tyrol, Greece, Asia Minor to Transcaucasia, etc., flying in June and July.
- renodata.* **C. renodata** Püng. is also very near *putridaria*, but rather larger, especially the ♀, the forewing more elongate and pointed, the colour pale grey-brownish, the markings weaker, without the dark band-like filling in of the double lines. From Askhabad, where *putridaria* also occurs.
- corollaria.* **C. corollaria** H.-Sch. (= *unicata* Guen.) (10a as *unicata*). A small species, though somewhat variable in size. Forewing yellowish white, with basal patch and moderately broad median band dark brown, the latter somewhat marked with black at the costal and hindmargin and containing some pale lines or blotches and a large black cell-spot; subterminal line preceded by a light yellowish-brown shade and followed by a pair of more or less confluent dark spots between the radials; some weaker dark terminal shading towards the hinder angle. Underside with median band less dark, ill-defined proximally; distal area of both wings nearly as that of the hindwing above. Recorded from the Balkan Peninsula, Asia Minor, N. Syria and Transcaucasia. —
- centralisata.* **centralisata** Stgr. has the ground-colour of the forewing mixed with pale brown, (tending to form subbasal and distal bands) the basal and median area filled in with dark fuscous (not mottled with the ground-colour). Ferghana, Issyk-kul and Transcaspia. A transitional form is recorded from Mardin.
- cuculata.* **C. cuculata** Hufn. (= *sinuata* Schiff.) (10a) is characterized by the alternate bands of chestnut and blackish brown in the proximal area, the white median area, the form of the postmedian band, etc. — ab.
- circulata.* **circulata** Rbl. is a remarkable and perhaps unique aberration in which the dark bands of the central area are connected on the subcostal and median veins, enclosing a roundish white patch. — Larva green or yellowish with conspicuous blackish or dark purple subdorsal stripes. On Galium. Pupa reddish, with browner wings, hibernating. *cuculata* flies in June and July and is distributed in Europe (except the extreme north and south), Transcaucasia, Central Asia and East Siberia.
- yokohamae.* **C. yokohamae** Btlr. (= *rogenhoferi* Graes.) Nearly related to *cuculata*, but with the postmedian costal patch narrower, sometimes more broken into lines, the lines which run from it across the median area obsolete, the distal area without the light red-brown shade, remaining pale anteriorly, but clouded with dark smoke-colour (narrowly brown proximally) from the 1st radial onwards. S. E. Siberia, Korea and Japan.
- subangulata.* **C. subangulata** Koll. (= *cymaria* Btlr. nec Guen.) (10b). Median band of forewing distally shaped nearly as in *unangulata*, with which, however, it has otherwise little in common; the reddish median band, preceded by a ferruginous one, is distinctive. Under surface strongly mixed with ferruginous brown, especially distally; postmedian band distinct, whitish, divided; subterminal line represented chiefly by white dots. Variable in coloration, breadth of median band, etc. N. W. Himalayas and Afghanistan.
- axonaria.* **C. axonaria** Ob. (9b). Closely related to *subangulata* but with narrower, distally straight-edged (or almost straight) median band; ground-colour of forewing on an average more brownish, which is especially noticeable

in the pale postmedian band. Hindwing slightly more brownish-tinged than in *subangulata*, rather strongly marked. W. China. Extremely like the Indian *mediovittaria* Moore, which, however, has the hindwing white, very feebly marked.

C. torpidaria *Leech* (7i). A very distinct species, which I do not know where to place. The ♂ anal tuft is so strongly developed as to suggest a possibility that the discovery of the early stages may necessitate its removal to LEDERER's first group (our first 6 subgenera). The ♂ antenna is thick, minutely ciliated, the face rather flat, shortly rough-scaled, palpus rather long, discocellulars not biangulate, 2nd radial arising from the centre. The shape and coloration of the forewing somewhat recall the much smaller *schneideraria*, but the markings are even more blurred, the surface with strong gloss, the white postmedian band broader and clearer, the hindwing almost unmarked. Mou-pin. Possibly an *Entephria* or an ally of *tophaceata* with modified discocellulars. *torpidaria*.

C. fasciaria *Leech* (7k). A broad-winged, rather glossy species of small size, the forewing with normal markings (the subterminal line and oblique subapical streak too broad in our figure), the hindwing dark, with an indistinct pale postmedian band, but best recognized by the very long palpus, which measures just over 3 times the diameter of the eye. Both wings beneath dark with indications of pale postmedian band, the hindwing rather more mixed with white. Central and West China and Formosa. *fasciaria*.

C. fatuaria *Leech* (7k) has also a very long palpus, though rather less extreme than in *fasciaria*. Much smaller, the white area beyond the basal patch much extended, projecting into the median area so that the dark band is narrow, with strongly concave anterior margin, distal area not very dark excepting the conspicuous patches between the radials and close to the hind angle. Chang Yang, Central China. *fatuaria*.

C. unangulata *Haw.* (= *amniculata* *Hbn.* = *bicolorata* *Bkh.* nec *Hufn.*) (8b). Forewing with basal patch and median band approximating or meeting at hindmargin, proximal edge of median band strongly curved, interspace mostly light brown; distal edge of band forming a single obtuse or acute angle. Underside sharply marked. — ab. **angustifasciata** *ab. nov.* has the median band very much narrowed, scarcely, if at all, extending beyond the discocellulars. — Larva brown-grey, the first 5 abdominal segments with short, thick black dorsal marks, preceded by whitish spots; subdorsal lines fine, blackish; venter paler, yellower. On chickweed and other Caryophyllaceae. The pupa hibernates. Imago in June and July. Central and Northern Europe. — **gracilaria** *B.-Haas*, from Munku (Sajan district, Siberia), is said to be rather smaller, purer white, the distal area (especially of the hindwing) broader and darker, white subterminal conspicuous. — **luctuosaria** *Ob.* has the dark areas of the forewing darker than in typical *unangulata*, a dark postmedian line on hindwing, distal area of both wings sharply defined proximally, a paler spot in its middle, subterminal line more or less interrupted; under surface browner, postmedian line sharp, discal dots not very black. S. E. Siberia, Korea and Japan. — **cineraria** *Btlr.*, from Japan, is very variable, postmedian white band broadened, dark shading of distal area usually much weakened or almost obsolete, leaving conspicuous dark spots at costa, between the radials and posteriorly. Hindwing pale, weakly marked, discal dot reduced. Japan. This and the preceding may be good species. *unangulata*.
angustifasciata.
gracilaria.
luctuosaria.
cineraria.

C. coangulata *nom. nov.* (= *subangulata* *Stgr.* nec *Koll.*). Very similar to *unangulata*, wings slightly longer, the dark parts more brownish, median band with its distal angle more produced, distal area nearly as in *cineraria* (the dark patches less noticeable), hindwing weakly marked, with discal dot small and weak. Under surface weakly marked. Mongolia: Uliassutai and Changai Mountains. *coangulata*.

C. ochreata *Moore* (7i). Size of *unangulata* but coloured nearly as *picata*, rather duller, the hindwing darker grey. The distal projection in the middle of the central band is strong and double, as in *picata*, but the smaller projections between the other veins more noticeable than in that species. ♂ antennal ciliation as in *picata*. Distributed in N. W. India and Afghanistan. The olive-green tinge soon fades to dirty ochreous, which probably explains MOORE's name. *ochreata*.

C. picata *Hbn.* (= *biangulata* *Haw.*) (10b). Nearly related to *unangulata* but larger, with an admixture of olive-greenish in the forewing, distal edge of median band with a strong double prejection, the white band beyond it slightly less glossy, more irregularly defined distally, the lunules of the subterminal line deeper, etc. Specimens from China have the distal edge of the median band rather more strongly dentate and appear somewhat intermediate towards *ochreata*. — ab. **albofasciata** *Gauckler*. The lines and shading between the postmedian and subterminal obsolete, leaving an almost clear white band 3.5—4 mm in breadth. — ab. **lacteo-marginata** *Raynor*. The white postmedian band of normal breadth but the entire area beyond light creamy brownish, not olive-green. I have seen the type specimen, a bred example but small and weakly marked. Larva rather variable in colour, very similar to that of *unangulata*; I have noted no constant differences. On chickweed and other Caryophyllaceae. The pupa hibernates. Imago in May—July, in many localities partially double-brooded. Central Europe, S. France, N. Italy, the Ural, Transcaucasia and Central and W. China. *picata*.
albofasciata.
lacteo-marginata.

- luctuata*. **C. luctuata** Schiff. (= *transversata* Thnb. = *lugubrata* Stgr.) (10d). Very distinct. The sharp contrast of the black and white colouring somewhat recalls *hastata* but the differences, except in the case of the blackest varieties, are too obvious to need enumerating. Under surface similar to upper, both wings paler basally. Very variable in the relative proportions of the white and black; median band often very narrow, never very broad, but (as in the 3 preceding species) not sharply differentiated from the proximal area. — **albidior** Alph. (10d), an infrequent aberration in Europe but perhaps the principal form in Kamtschatka, has the white band on both wings much broadened, the proximal half of the hindwing sometimes more mixed with white, the under surface much more extended white. Both my examples from Barracouta, E. Siberia, also belong here. — **denigrata**. *denigrata* Gillmer is a melanotic aberration with the postmedian band infuscated, the subterminal inconspicuous, otherwise almost wholly black. One example from Plauen. — **borealis** Petersen scarcely differs in the forewing from the name-type, though the dark proximal area is still more black; on the hindwing the basal and distal areas have no white admixture and the white band is as narrow throughout as it appears at the inner margin in the normal form; it is divided by a dark line. Esthonia, Arctic Norway and N. Finland, possibly a local race in these localities. I have a similar example from Sajan, Siberia. — **wendlandti**. *Fuchs* is perhaps a modification of *borealis*, perhaps partly teratological, as STAUDINGER suggests; wings broader than usual, hindwing above and beneath black with a sharply defined white band which becomes narrow at both extremities. Taken at St. Goarshausen. — **obductata** Möschl. (= *concordata* Walk.) perhaps never occurs in Europe, or only as a very rare aberration, which would not differ very greatly from ab. *denigrata*. Forewing nearly as in *borealis*, but with the white band narrowing posteriorly; hindwing above uniformly black, rarely with very slight remnants of the white band, beneath with narrow, obsolescent dirty white band. Labrador, W. Canada, etc. Separable from *hastata gothicata* by its different neurulation, smaller size, narrower median area, etc. — Larva rather stout, green, with 3 dorsal lines, or more brownish with lozenge-shaped dark dorsal pattern. It feeds on species of *Epilobium* and some of the late larvae hibernate; often, however, the winter is passed as pupa. The pupa is stout, blackish-brown, with fine anal point. The moth flies in May and again in August. Central and N. E. Europe, Central Asia, Siberia and N. America.
- undulata*. **C. undulata** Leech (13c) is apparently a somewhat isolated species and I am quite doubtful about its position. Face nearly smooth, not at all protuberant. Palpus rather long. Antenna in ♂ minutely ciliated. ♂ genitalia strongly developed. Narrower-winged than *luctuata* and much more glossy. Forewing with apex pointed, distal margin very oblique; black-brown with 7—9 fine irregular white lines, in part extremely fine or obsolete, and a white or pale ring surrounding the very large, roundish discal dot; subbasal white line fine but distinct, twice indented, strongly outcurved between; antemedian thicker, at least at costa, twice incurved, projecting between; postmedian irregular, thick in its anterior half; a white spot in the apex followed by a row of conspicuous white dots close to the distal margin. Hindwing similarly marked. Under surface with the white markings more extended. Chekiang to Central China.
- molluginata*. **C. molluginata** Hbn. (= *poecilata* Fuchs) (7f). Scheme of markings similar to that of *alternata*. Larger, much paler, the markings of the forewing being light brown (sometimes rather more grey), the middle of the median band wholly or in part pale. Under surface similarly marked to upper, the forewing rather more weakly. — ab. **inusitata** Guen., founded on a single ♀ from Hyères, is described as ashy grey without any admixture or brown or yellowish, more weakly marked, the median band less sinuous, the discal dot of the forewing smaller. — Larva moderately slender, yellowish grey, with dark dorsal line on thorax and posterior segments, the first 5 abdominals with elongate, anteriorly pointed, whitish bordered dorsal spots; lateral stripe grey-brown. On *Galium mollugo* in August, the pupa hibernating. The moth appears in June and July. It inhabits Southern Central Europe, S. Norway and Sweden and Transcaucasia.
- albostrigaria*. **C. albostrigaria** Brem. (= *eliela* Bthr., ? *unduliferaria* Motsch.) (10h). Very pale sand-colour, traversed by numerous thick white lines, the one which bounds the central area distally more irregularly formed than the rest. Under surface similar but with the sand-colour (or light brown) darker, the proximal part of the forewing without white lines but with a single, incomplete darker line. S. E. Siberia, China, Korea and Japan. Probably MOTSCHULSKY's older name will have to be restored for this species.
- bilineata*. **C. bilineata** L. (10h ♂, 10i ♀). Very variable in colour, especially in the ♀. The name-type has both wings bright yellow, the median area of the forewing not strongly differentiated, though there is often a slight darkening towards the postmedian line. Abundant in most parts of Europe, also distributed in N. Africa, Asia Minor, Syria, Transcaucasia and according to STAUDINGER reappearing in E. Siberia. — ab. **dumetata** Schr. is described as paler leather-yellow with discal dot of forewing well expressed and the central lines of the median area forming 4 roundish or somewhat angled rings. — ab. **infuscata** Gmpbg. (10i) is a frequent aberration (especially in the ♀) in which the median area is more or less filled in with fuscous. Occurs equally commonly among specimens of the testaceous colouring, which might be designated *testaceolata-illineata*. **illineata** ab. nov. entirely lacks the transverse lines, being uniform yellow or with the median

area feebly darkened. — **testaceolata** Stgr. (10i) has the forewing, together with the inner margin of the hindwing, testaceous instead of yellow. It is in part racial, in part perhaps individual, and occurs in N. and E. Scotland, Spain, Algeria (? a small local race), Sicily, Greece, N. E. Asia Minor, the Taurus, Syria, etc. Commonest in the ♀. — **subgriseata** Stgr. Forewing testaceous-grey or fuscous, hindwing also more brownish tinged than in the typical form, in Persian examples almost entirely dark brown. N. Persia, Asia Minor and Greece. I have not seen it; possibly not differentiable from *hibernica*. — **hibernica** Prout (= *infuscata* Kane nec Gmpbg.). Forewing almost unicolorous fuscous brown, hindwing ochreous brown. Western Ireland. — **atlantica** Stgr. Small, on an average narrower-winged than the type, duller, darker yellow, the transverse lines more fuscous, the median area about as in ab. *infuscata*, its central band not rarely white or whitish, Shetland Islands and the Outer Hebrides. — **bohatschi** Aigner (10i) ♂ rather darker yellow than the type, in places slightly suffused with fuscous, a narrow greyish band (sometimes interrupted) in the centre of the median area of the forewing, the white lines conspicuously dark-edged. ♀ with forewing brown or fuscous, hindwing strongly suffused with the same, the rest as in the ♂. Cyprus. I have seen transitions from Constantinople and REBEL records such from Bosnia. — **pallida** form. nov. Paler yellow, slightly suffused with grey in median area and near distal margin, central band of median area generally whitish, a whitish apical dash, the lines rather strongly expressed, brown. Labyrinth, Crete, 5 ♀♀ in coll. Brit. Mus. — **isolata** Kane. Both wings throughout blackish fuscous. Only known from the Island of Dursey, off the west coast of Ireland. KANE believes it is now extinct. — Larva moderately stout, segment-incisions well marked, head small; green with darker green dorsal line, on the thorax very indistinct; subdorsal and lateral lines yellowish white; venter darker green, with yellow lines. On grasses and various low plants, hibernating. Pupa rather strongly sculptured, thorax and wings olive-greenish, abdomen dark red. The moth flies throughout the summer months, as it emerges over a considerable period, while in some localities there seems to be a partial second brood.

C. griseescens Stgr., which was described as a probable variety of *bilineata* but afterwards raised to the rank of a Darwinian species, is said to be grey, in the forewing without a trace of brownish or yellowish, in the hindwing occasionally more brownish costally. The markings are about as in *bilineata*, or with some approach to *bistrigata*, the median area of the forewing sometimes shows a narrow darker central band. Amasia and Tokat and once in Greece.

C. bistrigata Tr. (= *quadrstrigaria* Guen.) (10i), which represents *bilineata* on Sardinia and Corsica, is likewise considered a Darwinian species. Ground-colour nearly as in *testaceolata*, but on both wings strongly irrorated with grey; discal dot of forewings enlarged; the transverse lines strong and dark; median area of forewing broad, darker than the areas which adjoin it; postmedian line more sinuous, with deeper indentations and forming a pronounced bilobed projection in the middle.

C. consentaria Frr. (= *fluidata* Led., *russariaria* H.-Sch.) (13b). Narrower-winged than the three preceding species, more glossy, ground-colour more white, showing in the middle of the median area an indistinct, rather thick white lines bordering the basal and median areas; these and the intermediate areas less yellowish brown; median area distally as irregular as in *bistrigata*; subterminal line distinct, rather regular. Hindwing with postmedian line angulated in middle, subterminal line as on forewing. Under surface moderately well marked. Ural, Altai, Tarbagatai Mountains and Amurland.

C. centrostrigaria Woll. (= *mediata* Walk., *latirupta* Walk., *luscinata* Z., *interruptata* Rbl.) (13b). This and the two following species have often been referred to *Horisme* but lack the crested abdomen. *centrostrigaria* is variable, the median area sometimes entirely dark-filled, much more commonly broken into distinct or indistinct dark lines with some darker shading proximally to the cell-spot, or merely with dark proximal and anterior part of distal edge; the distal area of the forewing nearly always shows the costal spot, pair of dark spots between the radials, etc. Distributed in the Atlantic Islands and throughout Eastern America, extending as far south as Buenos Aires.

C. caespitaria Chr. (= *pacuviaria* Ob.) (13b) is shorter-winged than *polygrammaria*, with the lines less oblique, somewhat more sinuous. The distal area is somewhat more irregularly marked, in this rather resembling *polygrammata*; variable. Amur and Ussuri district.

C. polygrammata Bkh. (13l) differs from *centrostrigaria* in the rather narrower wings, less crenulate distal margin of hindwing, less varied colouring, almost straight lines, absence of the dark spots of distal area, evenly dark-shaded subterminal line, uninterrupted terminal, etc. The typical form extends from N. Spain and S. France through Central Europe to Central Asia. — **conjunctaria** Led., chiefly from S. Europe and N. Africa, is generally paler, without conspicuous dark markings in the central area, but very inconstant. — The larva is reddish grey with dark, light-edged dorsal stripe, which is interrupted on the middle segments; these

segments show also oblique longitudinal streaks running laterally. It feeds on various species of *Galium* and is said to hibernate. The moth is double brooded.

- triangulifera*. **C. triangulifera** Moore (8e). This species and the 9 which follow, together with some Indian species, probably form a biologically natural genus more nearly related to *Lygris* or *Eustroma* than to *Cidaria*. The face is generally broader and smoother, the palpus longer, with 2nd joint rougher-scaled above and 3rd joint distinct, sometimes longer, the anastomosis of the costal vein of the hindwing on an average shorter, the ♂ abdomen rather slender, with light dorsal line or stripe, the wings smoothly scaled, with different pattern, in particular with some wedge-shaped or oblong dark markings in the subterminal area of the forewing recalling those of *Lygris prunata*. *triangulifera* is characterized by the form of its median band. Dharmsala to Assam.
- decurrens*. **C. decurrens** Moore (= *oblongata* Walk. nec Guen.) is distinguished by its very oblique white face, which ends in a pointed tuft, long palpus, rounded forewing, with intricate pattern of fine, very oblique white lines on the median area, two fine lines beyond, meeting at costa, fine white line from apex, crossing an equally fine white subterminal about the 1st radial vein, and especially by having the entire distal area from the 3rd radial to the hindmargin whitish, clouded with yellowish and ferruginous; only at the distal margin itself the fuscous ground-colour reappears as interneural streaks. Hindwing grey with a pale line (sometimes indistinct) quite near the distal margin, otherwise almost or altogether unmarked. Under surface paler, but still not so pale as in *silacea*; forewing with the markings of the distal area faintly showing through; hindwing with a postmedian line nearly as in *silacea* and a discal dot, usually smaller than in that species, distal area weakly marked. Antenna scarcely ciliated. N. India, Central and W. China and Japan, May, June and August.
- illitata*. **C. illitata** Wileman, of which only the type specimen is known, is probably an extraordinary aberration of *decurrens*, certainly a very close ally. Forewing in proximal half fuscous (irregularly bounded), with two short white streaks at costa; distal area anteriorly as in *decurrens*, in the middle with a long whitish blotch, which reaches right to the cell, posteriorly with the ferruginous colour rather more extended proximally. Ohoki, Iyo, Japan, taken in May.
- capitata*. **C. capitata** H.-Sch. (= *balsaminata* Frr., *mariesii* Btlr., *pryeri* Btlr.) (10 k). Very near *silacea*, on an average somewhat smaller, slightly rounder-winged (intermediate towards *decurrens*), thorax (except the tegulae) and abdomen pale ochreous dorsally, the dark markings of the forewing on an average darker, median band never white-intersected on the veins, its proximal margin less deeply angulated, posterior half of distal area weakly marked, and with some light ferruginous clouding somewhat recalling that of *decurrens*. — **capitulata** Stgr. is smaller, the distal area of the forewing duller, dirty grey, not brownish; subbasal area and hindwing also somewhat darkened. Amur and Ussuri districts and as an aberration in Japan (Hakodate). BUTLER's type of *mariesii* is somewhat transitional. — Larva closely similar to that of the following species, perhaps rather more slender, but I know of no certain distinction. On Impatiens. Pupa brown with dark markings hibernating. Imago in April—May and in August, local in Central Europe and Japan.
- silacea*. **C. silacea** Schiff. (= *posticata* F., *cuneata* Don., *albolineata* Pack.). We have neglected to figure the name-typical form of this species, which, however, only differs from the ab. *insulata* in lacking the white veins on the median area. ♂ antenna, as also in the preceding species, with minute ciliation. Thorax dorsally more mixed with fuscous than in that species, abdomen dark-spotted, with pale central line. — ab. **insulata** Haw. (10 l, as *silacea*). The median veins, which even in the type-form are usually white at the distal edge of the median band, are here white right across it, sometimes narrowly, sometimes more broadly; at times also the 3rd radial is white. Ab. *insulata* occurs chiefly in the first generation, the name-type chiefly in the second; but the variation is not entirely seasonal. — **umbrosaria** Motsch. (= *deflavata* Stgr.) (10 l, as *deflavata*) is a darker form, chiefly, if not entirely, alpine and boreal, with the blackish brown colour predominant, not being mixed with brownish or yellowish scales. In extreme examples the thorax and abdomen are wholly fuscous. Pyrenees, Alps, Lapland, the mountains of Central Asia, Dharmsala, Japan, etc. Perhaps intergrades with the following. — **oblongata** Guen. (= *substituta* Walk., ? *subfalcata* Warr.). On an average larger, somewhat longer-winged, distal margin of forewing perhaps straighter, colour intermediate between the type and *umbrosaria*, band of forewing more deeply indented distally on the median veins, hindwing shining whitish, the grey shade at inner margin restricted; underside less pale than in the pale-hindwinged European examples. N. India and Tibet. — **angustaria** Leech, from Pu-tsu-fong, is even longer-winged, the forewing very dark, with whitish veins as in *insulata*, the hindwing glossy, mixed white and brownish-grey, more sharply marked than the other forms. — Larva long and thin, variable in colour, green or flesh-colour, thoracic and last 4 abdominal segments with red or blackish mediodorsal line, the middle segments with blackish dots, venter with white line, sometimes pink-edged. On Epilobium, Circaea and Impatiens. The pupa hibernates and is compact, brownish green, marked like those of *Lygris*. The moth appears in May—June and (except in northerly localities) again in August. Central and N. Europe, with local forms in Asia.

C. fastigata *Püng.* Closely similar to the yellow-mixed form of *silaceata*, slightly larger but chiefly *fastigata*. differing in having the distal edge of the median area right-angled outwards in the middle, the postmedian line of the hindwing also more bent in the middle; markings similar but (especially beneath) more obscure. Kuldja and Ferghana, beginning of June. In the specimens before me, as well as in PÜNGELER's figure, the proximal part of the hindwing is rather strongly darkened.

C. dentifera *Moore* (= *nivicincta* *Btlr.*) closely resembles a rather large, rather dark, little variegated *dentifera*. *silaceata* with broad, distally rather smooth-edged median band, but can be separated at once by the antemedian line, which runs almost straight (rather oblique outwards) from costa to behind the 2nd median vein, is here *acutely angled* and sharply white, then runs basewards for a short distance, is again right-angled (or sharply curved) and finally runs vertically to the hindmargin; a band between basal and median bands is fully as dark as they, with the veins whitish. Dharmasala; also in Sikkim and Assam.

C. fervidaria *Leech* (71) differs essentially from all the preceding in its orange, fuscous-mixed hindwing *fervidaria*. and admixture of orange in the paler parts (and on the 3rd radial and median veins of the central area) of the forewing. Hindwing variable, sometimes almost uniformly dusted with fuscous excepting a narrow clearer orange band (or thick line) behind the middle. Under surface orange, more or less suffused or irrorated with fuscous, especially in the proximal part a postmedian band remaining clear orange, the distal part of the hindwing also somewhat varied. Central and W. China.

C. subochraria *Leech* (71, as *subochreata*) is so similar to *fervidaria* that I suspect it belongs here although it *subochraria*. has lost the characteristic distal markings of the group and is also somewhat aberrant in that the discocellulars of the hindwing are appreciably angled at the origin of the 2nd radial, on account of an inward curve of the 2nd discocellular. Easily distinguished from *fervidaria* by its much more weakly marked forewing; the hindwing and underside also are on an average duller coloured, though variable. Omei-shan in June. ♀ unknown; ♂ abdomen slender (more so than in the slightly smaller *fervidaria*), antennal ciliation minute; palpus rather long, rather slender but rough-scaled.

C. mactata *Feld.* (101 as *mactaria*) may be known at once by its large size, strong gloss and by the *mactata*. peculiar shape of the median band. Under surface brown, the costal region of the forewing and the proximal two-thirds of the hindwing sprinkled with yellow, most of the white markings of the upperside reproduced in pale yellow. Antenna in ♂ pubescent. Japan, Korea and Amur to Central and West China.

C. corylata *Thnb.* (101). Very distinct from any other European species, but probably the discovery of *corylata*. the life-history of the Oriental forms which follow will show that they are related to it. Palpus long; ♂ antenna almost simple. Very variable. The most constant markings are those of the distal area of the forewing; especially noticeable are the three black marks (short lines) between the 5th subcostal and 3rd radial, the first joined to a short oblique mark from apex, and the pale spot behind the 3rd radial. The name-type has a complete median band, somewhat variable in breadth and shape. — ab. *ruptata* *Hbn.* (= *defracta* *Strand*, *ruptata*. *interrupta* *Hirschke*) is a rather common aberration in which the band is interrupted with white at the fold. — ab. *albocrenata* *Curt.* (= *effusaria* *Stgr.*) is a much more striking form (or group of forms) apparently *albocrenata*. only known from North Britain and Denmark and characterized by the more or less complete obsolescence of the median band, which is only represented by some indistinct grey dusting. Not infrequently the light olive-brown bands which precede and follow the median are much darkened but this is by no means always the case. — *fabrefactaria* *Ob.* has the proximal half of the basal patch much lighter than the distal half, the *fabrefactaria*. narrow band proximal to the subterminal also dark, the area between the basal and median not very bright. It constitutes a local race in the Ussuri district. — *granitalis* *Btlr.*, from Japan, is on an average rather larger, *granitalis*. the edge of the basal patch more oblique and dentate from costa to fold, then retracted, the median band dentate proximally and with distal excision almost or quite as deep as in *aliena*. Coloration variable. — Larva slender, cylindrical, with bifid head and a single projecting anal point; green, with variable dorsal pattern in red-brown or purple-brown, generally consisting of a streak on the anterior and posterior segments but broken into dots and spots on the middle ones. On oak, birch, blackthorn, etc., July—September. The pupa is described as yellow-brown spotted with black. *corylata* flies in June and is found chiefly in wooded districts, resting by day on the tree-trunks. Central and Northern Europe, N. Italy, the Ural and Amurland.

C. albida *Herz* was described as a variety of *corylata* but raised by BANG-HAAS to specific rank. Fore- *albida*. wing perhaps slightly broader. Both surfaces whiter, the forewing above only very weakly olive-mixed; basal patch with less dentate edge; median band rather broader, a good deal mixed with white, the white in the narrower posterior part of the band forming a distinct 8. Siberia: Olekminsk (Lena district) in June; Tunka (Sajan).

- aliena*. **C. aliena** Btlr. (= *tsermosaria* Ob.) (101 ♀, as *aurata*) differs from *corylata* in having the olive brown areas more golden brown, the dark areas blacker, but especially in the shape of the median band; the apical streak is white or whitish and the 3 anterior submarginal marks are thick, commonly united into a single blotch. Beneath, the forewing weakly reproduces the markings of the upper surface, the hindwing shows rather strong grey dusting and 2 or 3 dark lines, not angled at the 3rd radial like the single conspicuous dark line on the underside of *corylata*. Somewhat variable; the ♀ which we figure (after OBERTHÜR) is aberrant in having distinct pale spots and lines on the median band, which is generally solid. Dharmsala, Kulu and Ta-chien-lu; ? Koko-Nor; also Sikkim and Bhotan. HAMPSON sinks *aliena* to the following.
- aurata*. **C. aurata** Moore (= *perpulchra* Btlr.) differs in its brighter golden-yellow colouring both above and beneath, broader space between basal and median bands, quite different shape of the latter, less darkened distal area, with broad yellow apical streak, etc. The median band has its proximal margin strongly excavated in the middle, its distal edge more deeply dentate. Hindwing generally greyer than in *aliena*. Dharmsala to Assam. — *fulgidaria* Leech is evidently nothing more than a rather deeply and brightly coloured race of *aurata*, generally (but not invariably) with rather darker hindwing and abdomen. Perhaps even, on comparison of more extensive material, it will prove to be merely a synonym. Founded on 4 beautiful specimens from Pu-tsu-fong.
- nigri-fulvaria*. **C. nigrifulvaria** Hmps. (71). Somewhat larger than *aurata*, the yellow parts much darker, the large basal area sharply divided by a curved, subdentate white line, the proximal part fawn-colour, the proximal excavation of the median band placed in the middle of the cell (not, as in *aurata*, on the median vein), the distal margin more clouded with black-brown. Only one specimen known, a ♀ from Rala, in the N. W. Himalayas, June.
- albi-punctaria*. **C. albipunctaria** Leech (71). Coloration nearly as in the preceding, the brown parts rather brighter (more fulvous); but chiefly distinguished by the increase of white, the lines being thickened, the postmedian forming a band in the anterior part of the wing; a large *pure white spot* in the middle of the distal margin. Hindwing whitish, darker bordered. Ta-chien-lu and Pu-tsu-fong.
- chimakaleparia*. **C. chimakaleparia** Ob. (8h) differs from the preceding — which may possibly be found to be an aberration of it — in the creamy white ground-colour; of the fulvous colour nothing remains excepting the proximal half of the basal patch, a broad patch in the anterior half of the dark median band and a line before the subterminal. Hindwing more strongly marked than in *albipunctaria*, having conspicuous grey lines and sometimes a broad grey border. From the same localities as the preceding.
- rubidata*. **C. rubidata** Schiff. (10m). A very distinct species. The peculiar arrangement of the markings of the median area bears some resemblance to that of *badiata* but wing-shape, colouring and structure are very different. In its name-typical form, *rubidata* is recognizable at once by the more or less red colouring between the basal and antemedian and beyond the postmedian lines. Inhabits a great part of Europe, also the Issyk-kul district and perhaps Brusa. — *fumata* Ev. (= *fumosaria* H.-Sch.) is a smoky form which in large measure replaces it in Asia and occurs sometimes also in Eastern Europe. STAUDINGER records it from the Ural, Sarepta, Altai, Roumania, as an aberration in Hungary and transitional forms in N. E. Asia Minor and Transcaucasia. — Larva moderately stout, tapering anteriorly; grey-brown or reddish brown, thorax and posterior segments with dark dorsal line, the intermediate segments with blackish V-shaped dorsal markings, pointing forwards and enclosing small black spots in pale triangular patches; subdorsal and lateral lines ochreous, most distinct anteriorly and posteriorly; a pale ventral stripe, with interrupted grey medio-ventral line. On Galium. Pupa short and stout, glossy, red-brown, with knobbed black cremaster; hibernates. The moth generally appears in the following May, June or July but is rather uncertain in its appearance, not rarely passing a second winter before emerging, occasionally, on the other hand, partially double-brooded.
- obscura*. **C. obscura** Btlr. (= *butleri* Leech) was unfortunately described from a rare aberration, a large ♀ with the forewing proximally and medially almost uniformly dark-dusted, the blackish bands being less dark than usual, the centre of the median area considerably darker. Hindwing also darkened, almost unicolorous. Underside, as also in the following form, ochreous brownish, the basal area of the forewing dark-suffused, both wings with dark distal dot, 3 wavy dark lines beyond, then a weakly dark-divided pale band, finally a dark border containing an interrupted subterminal line or row of dots. Yokohama. — *ab. subobscura* *ab. nov.* (11f, as *obscura*). I propose this name for the commoner form, in which the median area is paler, with the bands and postmedian line arranged nearly as in *rubidata* but further apart. Very near the variable Khasi race *fecunda* Swinh. Japan (Yokohama, etc.) and W. China (Moupin).
- aridaria*. **C. aridaria** Leech resembles *obscura* in size and shape, though the costal margin of the forewing appears somewhat more rounded; the hindwing above is similarly infuscated. Forewing dirty yellow-greenish, the basal

area darkened with ill-defined lines, median band broad (in the Kulu specimen with a stronger rounded projection between the 3rd radial and 2nd median than in the type), dark brownish-grey, the distal area with a large costal spot of the same colour (or slightly more reddish) proximally to the subterminal, an oblique dark subapical mark, joining a diffuse dark spot between the radials, an interrupted dentate dark line not far distally to the median band, some vague distal-marginal shading; subterminal line almost obsolete except at costa. Underside, weakly marked. Abdomen dorsally fuscous. W. China: Wa-shan; Kulu: Sultanpore. Only the ♀ known; nearly related to *curcumata* Moore.

C. tamaris Ob. (described as *Tephrosia*) is unknown to me but is certainly, according to the neuration, a Larentiid and probably a large, ample-winged *Euphyia*. Forewing violet-grey with the broad median area paler; the lines dark, consisting of slender basal, thicker subbasal, antemedian, postmedian and subterminal, more or less sinuous, mostly thickened at the wing-margins, the antemedian terminating in a triangular spot at the hindmargin, the subterminal interrupted by a large black spot between the radials; fringe chequered. Hindwing grey basally, darker distally, with large discal dot and well-marked postmedian line. Both wings beneath marked nearly as forewing above. Ta-chien-lu. *tamaris*.

Subgenus *Mesoleuca* Hbn. Face scarcely roughened. Palpus rather short. ♂ antenna nearly simple. Forewing with areole double. Hindwing with discocellulars weakly or moderately biangulate, the 2nd radial arising about or scarcely behind the centre.

C. alaudaria Frr. (= *bicuspidaria* Ghil.) (10b). Easily recognizable from our figure. Rather variable in respect of the median band, which may be more nearly obsolete or better marked and broader in its middle part than in the specimen figured; in all forms, however, the blackish triangular patch at the costal margin remains sharply differentiated, the middle part being lighter brown. Underside with distal borders nearly as above, both wings darker suffused to beyond the middle and with a white postmedian band. — ab. **culmaria** H.-Sch. has the white much extended, the dark costal patch almost obsolete, leaving free a dark discal dot. — ab. **abafii** ab. nov. has all the dark markings pale brown, only the discal dot black. Described without a name by AIGNER-ABAFI. — Larva slender, green, with yellow lateral stripe. July—August, on *Atragene alpina*. Pupa light brown with green wings; hibernating. Flies in June and July in the Alps, Carpathians and S. W. Russia. *alaudaria*. *culmaria*. *abafii*.

C. mandschuricata Brem. (10b). Closely related to *alaudaria*, of which it may be regarded as the eastern representative. The distal area of both wings is light brown, not dark fuscous, is not very sharply defined and the white ground-colour projects less angularly into it; the white subterminal line on both wings is thicker and is not dentate. — **borealis** Herz, from the Vilui district, is smaller and greyer and especially on the underside of the hindwing very dark dusted. — E. Siberia and China. *mandschuricata*. *borealis*.

C. bimaculata Leech (7f) is much larger than *mandschuricata*, the brown colour extended throughout the forewing, the hindwing more varied. Forewing beneath duller, more weakly marked; hindwing pale, strongly dark-dotted on the veins; the subterminal line obsolete. Ta-chien-lu, May—June. *bimaculata*.

C. albicillata L. (= *vestalis* Walch) (10c). A very beautiful and very well-known species, the dark markings contrasting elegantly with the broad creamy-white central area. — ab. **suffusa** Carrington is a remarkable form with the entire forewing suffused with dark leaden grey. — **casta** Btlr. (10c), from Japan, has the basal and distal dark markings (especially the latter) increased in extent, the white area consequently narrowed, the discal dots generally larger. — Larva moderately thick, tapering anteriorly; bright green with a series of red dorsal triangles, pointing forward, and with some reddish markings on the sides and on the anal flap. On *Rubus*, especially *Rubus idaeus*, July—September. Pupa compact, glossy dark purplish brown with the cremaster black; hibernates. The moth appears from May to July and is common in woods in a great part of Europe, the Altai, Issyk-Kul and S. E. Siberia. *albicillata*. *suffusa*. *casta*.

Subgenus *Melanthia* Dup. (= *Plemyria* Snell, nec Hbn.). Head large, face broad, rather protuberant, smooth scaled. Palpus short. Metathorax tufted. Areole double. Discocellulars not biangulate.

C. procellata Schiff. (10c, as *procellaria*) is characterized by the form of the median band, which is cut off squarely before the median vein and posteriorly either altogether wanting or dissolved into wavy lines; a large white spot in the dark distal border is also conspicuous. — In ab. **infumata** Rbl. the forewing is strongly suffused with brown, only the band before the middle remaining white. I have only seen transitions, such as is described by AIGNER-ABAFI, Ann. Mus. Hungar. vol. 4, p. 524. — **inquinata** Btlr. (10c) is less pure white, the basal patch rather larger, the median rather narrower, but often followed by wavy dark lines. Japan. It differs *procellata*. *infumata*. *inquinata*.

infuscata. little from the Indian race *catenaria* Moore. — ab. **infuscata** ab. nov. (10 c) is an extreme form of *inquinata*, of not very rare occurrence, with both wings suffused throughout with dark brownish smoke-colour. Nearly parallel to *procellata* *procellata* ab. *infumata*. — Larva brown, the middle segments with black dorsal spots, connected by a fine black line, posteriorly continued by a conspicuous chestnut-brown line; subdorsal line dark brown. On Clematis in August–September. Pupa rough, the surface being much pitted and wrinkled; uniform red-brown; cremaster very short. The moth flies in July and is locally abundant among the food-plant. Central Europe, Asia Minor, Transcaucasia, Altai and S. E. Siberia.

postalbaria. **C. postalbaria** Leech (13 n) is much more glossy, the forewing almost uniformly dark coloured, more reddish brown and in some specimens appreciably lighter between the median band and the dark terminal area; median band slightly darkened, of uniform width and intensity throughout, its margins somewhat sinuous; subterminal line indicated by some pure white dots, one behind the 3rd radial always and one or two posteriorly often conspicuous. Hindwing glossy white, broadly dark-shaded at inner margin, and with faint dark lines; terminal line dark, fringe strongly dark-spotted. Chang Yang, Pu-tsu-fong and Omei-shan.

Subgenus *Eulype* Hbn. Areole single. Discocellulars biangulate.

lugens. **C. lugens** Ob. (10 d) may be known at once by the broad median area of the forewing, only black at its margins, and by the mostly white, only narrowly black-bordered hindwing. The distal area of the forewing shows a white spot in the middle, as in some *hastata* and its nearest allies. The superficial resemblance to *semenovi* has been noticed above. W. China and Koko-Nor.

hecate. **C. hecate** Btlr. (10 d) differs from *hastata* *gothicata* in having the white band of the forewing strongly angulated in the middle, much broader anteriorly than posteriorly, not traversed by black dots; band on hindwing incomplete. Japan: Hakodate, Oiwake. Korea.

proserpina. **C. proserpina** Alph. is unknown to me but is clearly a near relative of *hecate*. Larger, the black ground-colour not tinged with brown, the postmedian white band less acutely angled and of more nearly equal breadth throughout, that of the hindwing moderately broad and continued across the wing; forewing in addition with a white antemedian spot behind the median vein; fringes black, apparently not chequered. Korea, only one example (♀) known.

C. hastata is extremely variable and splits up into several local races, some of which have perhaps as good a claim to be regarded as species as the following *thulearia*. — **hastata** L. (10 d), the name-typical form, is large, with the median band strongly broken behind the middle, the postmedian white bands broad, the “hastate” white marks in the middle of the distal area well developed. — ab. **laxata** Krulik. (= *latifasciata* Hirschke) has the white areas still further widened, the postmedian band much broader than usual, the black median markings narrowed and broken, no black dots in the postmedian band. Our figure approaches this form. — ab. **demolita** Prout is a more extreme form, the black median band only remaining as a small patch on the discocellulars and a small one at the hindmargin. — The larva of this race feeds chiefly on birch, spinning the leaves together to form a habitation; short, stout, tapering at the ends, rugose, with a black prothoracic plate; very variable in colour, usually some shade of brown, with ochreous spots or blotches on the belly and sides. Pupa short and compact, not very glossy, red-brown, cremaster broad, blacker. Hibernates. The moth flies by day, especially in the afternoon, and is on the wing in May and June. It has a wide range in Central and Northern Europe and in Asiatic Russia. — **subhastata** Nolck. (= *hastulata* Hbn. nom. praeocc., *nigrescens* Ckll., *sagittifera* Gmpbg.) (¹⁶²² ~~Se~~) is a smaller and darker race, chiefly from high altitudes and latitudes, the median band continuous, though spotted with white, the white mark in the middle of the distal area usually reduced to a small dot or spot. It has often been considered a separate species and the question cannot be regarded as yet absolutely settled. Our Scotch forms, however, which make a balloon-shaped habitation among the terminal leaves of *Myrica* gale, seems to some extent intermediate; if separable racially they would bear the name of *nigrescens* Ckll. In Scandinavia *subhastata* is polyphagous but shows a preference for *Vaccinium*. In Switzerland, also on *Vaccinium*, the larvae are said to be lighter dorsally than *hastata*. — **moestata** *subhastata* flies in July. — ab. **moestata** Nolck. (= *taunicata* Fuchs) is an aberration of *subhastata* with the black colour somewhat increased, the black median area little spotted with white. — ab. **nigrita** Rbl. has the abdomen unicolorous deep black. — ab. **hofgreni** Lampa (= *digitata* Djakonov) is black with the postmedian white band divided by a black line, no other white markings but a distal spot behind the 2nd radial and a small remnant of the subterminal line near the apex. Thus closely similar to *chinensis* Leech or *gothicata* *undulata*. Guen. — ab. **undulata** Strand, from the Loffoden Islands, is remarkable for having a continuous white subterminal line on the forewing and no sagittate mark. — **chinensis** Leech (= *moerens* Alph.). Black, with very little white excepting the broad postmedian band (which on the forewing is dotted with black) and an interrupted subterminal; the sagittate mark wanting or rudimentary. W. China. — **gothicata** Guen. does not really

belong to the Palearctic fauna, being the representative of *hastata* in N. America; but it seems to be distributed in the Arctic region. In its typical form it is even more black than *chinensis*, the forewing only with an angulated, black-dotted postmedian white band and traces of the sagittate mark, the hindwing almost entirely black. — ab. **furcifascia** Walk. is entirely black excepting the postmedian band of the forewing.

furcifascia.

C. thulearia H.-Sch. (10e) represents *hastata* in Iceland. It differs chiefly in its more brownish tone and the peculiar greasy-looking appearance of the wings (very different from the sharply black and white colouring of *hastata*) and the regular continuity of the subterminal line, which entirely lacks — or at most only feebly indicates — the sagittate mark of *hastata*. In the name-type the pale areas are slightly suffused but distinctly differentiated. — In ab. **islandica** Gmpbg. (a badly chosen name) these areas are white, nearly as in *hastata*. — In ab. **infumata** Prout both wings are almost uniformly smoky. — ab. **clara** Prout is a pretty form with the whole distal area of both the wings whitish except a very narrow stripe of the dark ground-colour which forms the distal boundary of the postmedian white band. — The larva of *thulearia* scarcely differs from that of *hastata*, but is in general blacker, less brightly marked. It feeds on dwarf birch and Vaccinium, occasionally on sallow. The pupa hibernates and the moth flies from the end of May to the beginning of July.

thulearia.

islandica.

infumata.

clara.

C. naseraria Ob. (6e) differs slightly in shape from typical *Eulype* and was described as a *Siona naseraria* (*Schistosteg*), but according to the essential structure it must be referred here. It is entirely without markings; both above and beneath, excepting the conspicuously darkened veins. W. China: Ta-chien-lu; Tibet, How-kow. June-July.

C. defricata Püng. Very distinct from all other known species, perhaps forming a new genus near *Hydrelia* or *Atopophysa*, palpus as in the latter. Size of *H. testacea*, apex more pointed, ground-colour rather cleaner white, though similarly dusted, only the 2 principal lines brown, wavy, the first almost straight, the second gently curved; discal dot black; the white outer band rather broad, bisected by a fine grey line, distal area mixed with grey, a still darker oblique mark from apex, as in *A. indistincta*. Hindwing pale grey, weakly marked. Forewing beneath dirty brown-grey, with the broad pale band indicated. Nikko, Japan, only the ♀ known (not "♂", as originally published).

defricata.

Subgenus *Epirrhoe* Hbn. Areole single. Discocellulars not biangulate.

C. brephos Ob. (13a). Transverse lines of forewing obliterated or scarcely indicated, the only conspicuous markings being an oblique narrow white postmedian band from the costal margin to the 3rd radial and a white costal dot or very small spot near the apex; cell-dot indistinct. On the bright orange hindwing the lines are restricted to the inner-marginal half. Forewing beneath orange to beyond the middle, cell-spot conspicuous, connected by a dark mark with the costa; a dark angular postmedian band precedes the white band, which is present as above; the fuscous distal area immediately follows the white band, but becomes much narrower in its posterior half. Hindwing beneath as above. Central and W. China, How-kow and Koko-Nor. June-July.

brephos.

C. lamae Alph. (= *nigrilinearia* Leech, *fausta* Th.-Mieg) (11i, as *nigrilinearia*) differs in having the lines and discal dot of the forewing better expressed, the median area broader, the white costal mark much narrower and quite differently shaped, sometimes also with a dark dividing line. The lines on the hindwing are thicker and more extended, the black distal margin somewhat broader. Ta-chien-lu, Omei-shan, etc. June-July.

lamae.

C. excentricata Alph. (81). Much smaller than *brephos*, the forewing above with quite the normal Larentiid pattern. In shape, also, it is associated rather with the species which follow than with those which precede. Both wings beneath orange, somewhat duller than the hindwing above, forewing apically and at distal margin slightly more brown, hindwing and costal margin of forewing with weak indications of brown transverse lines. Koko-Nor.

excentricata.

C. virginea Alph., described as an aberration of the preceding, has the distal margin of the hindwing more perfectly rounded, the forewing above darker brown (black-brown), beneath white with fuscous distal area and with the other markings much stronger and more extended, the hindwing above and beneath white, its fringe also white, weakly dark-spotted. Koko-Nor.

virginea.

C. castaria Leech (7k) is very distinct in the largely white wings with black borders, the median band of the forewing being virtually suppressed. Under surface similar to upper, forewing with clearer postmedian dark band, not connected in the middle with the terminal band, hindwing with black discal dot and indications of postmedian line. Face smooth, protuberant; palpus rather small. W. China.

castaria.

kezonmetaria.

C. kezonmetaria *Ob.* (13b) is aberrant in that the antenna of the ♂ is furnished with paired fascicles of rather long cilia; the palpus is also rather long and strong. The sharply marked forewing somewhat recalls *lugens* and *semenovi*, but the size is smaller, the ground-colour extremely pale yellow, not white, the markings browner, much more regularly shaped. The hindwing in the ♂ is entirely unmarked except for the minute discal dot, paired terminal dots and dark suffusion at base and inner margin. Forewing beneath with the proximal markings weaker, hindwing with fine, ill-defined postmedian line and sometimes one or two other similar lines proximally thereto. The only known ♀ has the hindwing much more strongly marked. W. China: Ta-tsien-lu, Wa-ssu-kow, Tsemala and Kiala, May—June. Those from the latter localities (high mountain forms, 4000—5000 m) are slightly blacker-banded and show a decided tendency toward angulation of the discocellulars of the hindwing.

tristata.

C. tristata *L.* (= *limbosignata* *Nolck.*) (10e). Superficially rather similar to *hastata subhastata* but smaller, the median band and the white band which follows it more angulated, subterminal line of forewing not forming the characteristic white mark behind the 3rd radial. Variable in the breadth and solidity of the central band, etc. — ab. **kerteszi** *Aigner* has the median band of the forewing almost entirely obsolete, only a dark spot on the discocellulars remaining. — ab. **nigrata** *Rbl.* has the abdomen deep black, only dorsally with narrow white edging to the segments. — ab. (?) **continuata** *Fuchs* is said to be paler grey-brown, both wings with continuous dentate subterminal line, fringes more broadly and regularly chequered with white. According to *FUCHS* this is not the true *funerata* (*pupillata*) but was formerly distributed by *STAUDINGER* under that name. Described from *Bornich*. — The larva is of moderate thickness, reddish-brown, with fine dark dorsal line and indistinct yellowish subdorsal but without the dorsal pattern of the *rivata*-group; quite similar, except in colour, to that of *galiata*. On *Galium*. The pupa hibernates; yellowish brown with the anal point short. Imago in May—June with a partial 2nd brood (cleaner white with darker markings) in August. N. and Central Europe, Armenia, Altai and Mongolia.

hastulata.

C. hastulata *Hbn.* (= *luctuata* *Hbn.* nec *Schiff.*) (10e). Extremely like *tristata*, on an average slightly smaller, ground-colour somewhat more yellowish white, the markings deeper black (in *tristata*, especially the median band and the veins between the subterminal and terminal lines, slightly mixed with brown scales), in the basal half of the hindwing well developed, subterminal line much interrupted, often nearly obsolete, fringe of forewing not, or scarcely, chequered with white between the 2nd and 3rd radials, on the other hand with the other white patches well developed (in *tristata* more uniformly chequered, though seldom broadly, the white spots cut by a fine dark dividing-line); abdomen dorsally black, with very narrow white transverse bands, whereas that of *tristata* (except the rare ab. *nigrata*) is white, with paired black spots. The underside generally shows some differences, but is rather variable in both species; in *tristata* it is commonly more yellowish white proximally than distally; in *hastulata* more uniform in tone throughout; in *tristata* the discal spot of the forewing is larger and generally well separated from the other dark markings, in *hastulata* smaller, touching a dark line (the beginning of the here narrowed median band), often almost lost in it. — ab. **albescens** *Rbl.* has the black distal area more or less mixed with white. I have not seen it. — Larva much more sharply marked than that of *tristata*, with a broad continuous brown lateral stripe, dorsal area light yellow-green. On *Galium*. The pupa hibernates and the moth appears at the same epochs as *tristata*, being pretty regularly double-brooded. N. Italy to Roumania, also Livonia, Sweden, Armenia, Ili, Koko-Nor and E. Siberia.

albescens.

pupillata.

C. pupillata *Thnb.* (= *funerata* *Hbn.*) (10e, as *funerata*). Also similar to *tristata*, the markings brown, not blackish, the white postmedian band on an average rather narrower, intersected by a continuous dark line, the broad distal area traversed by a regular, dentate subterminal line, a pale oblique subapical streak indicated; under surface light brown, the forewing indistinctly marked from the base to the postmedian, the subterminal still more strongly developed than above, tending to become connected with the distal margin by pale interneural streaks. — Asiatic specimens, especially those from Thian-shan, are darker than European, and in particular show more darkening on the hindwing basally and costally; they have been named var. **orientalis** *Osthelder*. — The newly hatched larva is very slender, whitish grey, becoming after 2 or 3 days grey-green. Full-grown the larva much resembles that of *alternata* but is more elongate and not nearly so reddish; olive-brown to blackish brown dorsal line on thorax and later abdominal segments deep black, first 5 abdominals with angled dorsal pattern; very variable. On *Galium* in two generations. Pupa rather compact, narrowing little posteriorly, yellow brown; hibernating. Imago on peat-moors, etc., May and July—August; very local in Europe (except the West), Central and East Asia.

orientalis.

fulminata.

C. fulminata *Alph.* (10e) likewise belongs to the *tristata* group but has the ground-colour more mixed with yellowish brown, the antemedian line less curved proximally, the postmedian of both wings more acutely produced in the middle, the underside still more strongly mixed with yellow-brown; subterminal line thick in places but irregular, more or less interrupted. Abdomen as in *hastulata*. Western Thian-shan and Ferghana.

C. galiata Schiff. (10b). Very variable in colouring, the median area usually broad, the darkening of the distal area irregular, very partial, sometimes altogether wanting, bounded proximally by dark dots on the veins. Hindwing pale grey, never very sharply marked. I regard as the name-type the first figured form — HÜBNER's fig. 272. This has the basal area and the margins of the median band (which is of moderate breadth) brown, the distal area fairly strongly marked. — ab. **chalybeata** Hbn. Median band broad, dark bluish slate-colour, distal area weakly marked, with a tinge of brown. Rather frequent in some localities, as at Zermatt. — ab. **unilobata** Haw. has likewise a broad dark median band but is without any tinge of brown, the distal area generally rather strongly shaded with grey, the hindwing rather dark. N. England and Scotland. — ab. **emina** Schawerda is a beautiful modification of *unilobata*, well known from Huddersfield, and said to be constant in Herzegovina, with the white distal area very weakly marked. — ab. **quadriannulata** Haw. has the subbasal pale area broken up into four separate white, dark-ringed spots. — **orientata** Stgr. is an ashy form in which the median area is not generally very sharply differentiated, being darker ashy, not bordered with brown and sometimes containing spots of the ground-colour. Hindwing darkened. Asia Minor, N. Syria and Transcaucasia. — Concerning a Russian form which has been named *eophanata* Krulik. I have unfortunately no information. Larva of moderate proportions, greenish-grey or yellowish-grey, with dark dorsal line, which is blackest on the thorax and last segments, subdorsal yellowish white, broadly bordered beneath with brown. On Galium. Pupa compact, glossy yellow-brown, the cremaster short; hibernating. Double brooded, flying in May-June and again in August-September. Europe (except the Polar regions), N. Africa, Asia Minor, Transcaucasia and E. Siberia.

C. timozzaria Const. (10a). Forewing quite distinct in coloration from *galiata*, the median band being much mixed with the ground-colour, so as to appear greyer, and enclosing a patch of the ground-colour anteriorly, in which is placed the small discal dot; the pale double band which follows it white proximally, more brownish distally, the distal area is darkened both proximally and distally to the subterminal line, which is therefore distinct. Corsica.

C. parvularia Leech (7h) recalls in coloration the *unangulata* group of the subgenus *Euphyia*, the proximal and median areas forming a continuous dark area, though the former is traversed by some slightly lighter, shining leaden-grey lines; the subterminal line is thicker and more dentate than in the *rivata* group. Underside of forewing more weakly marked, the white parts more brownish; of hindwing more strongly marked than above, with waved lines. Pu-tsu-fong.

C. latevittata Trti. should probably be placed here, as the figure and description indicate a rather near relationship to *rivata*. Wings rather less rounded, especially in the ♂; coloration similar, the median band of the forewing broader, darker, distally more excavated than in *unangulata* but with subacute angle projecting on the 3rd radial; proximally with rather strong undulate lines; subterminal line more weakly lunulate than in *rivata*; the hindwing appears somewhat darkened. Sardinia.

C. rivata Hbn. (= *sylvaticata* Haw.) (10a). This and the two following species form a very closely allied group. *rivata* is generally the largest and is further distinguished by its more glossy wings, broader, scarcely bisected postmedian white band (especially of the hindwing), less uniformly darkened (more blue-grey mixed) distal area and more white-mixed basal area of hindwing both above and beneath. Hindwing beneath with a brown band proximally to the subterminal but always interrupted between the 3rd radial and 1st median; in *alternata* this band is commonly uninterrupted. Median band extremely narrowed and broken. Larva very similar to that of *alternata*, in its earlier stages rather smoother and of a brighter green colour, while the adult larva is more sharply marked, the arrow-head markings filled in with white at their apex, a conspicuous black or brown lateral spot on the 5th and 6th abdominal segments which is wanting or indistinct in *alternata*. On Galium. Pupa short and stout, the wing-cases somewhat swollen and roughened, the dorsum and abdomen more glossy; red-brown, darker and anal extremity. Hibernating. Generally single-brooded, flying in June—July; in captivity often double-brooded. Central Europe, N. Spain, Corsica, Italy, etc. — **inexpectata** Krulik. from Russia, is unknown to me.

C. supergressa Btlr. resembles *rivata* in having the postmedian white band of both wings rather broad and scarcely divided by a dark line, but has about the size of *alternata*, the dark parts in general more uniform in colouring than in either of the allies, the proximal area of the hindwing less broken up into lines, the pale subterminal line of both wings usually more interrupted. The white band of the hindwing is perhaps slightly more angled distally at the 3rd radial. Japan and S. E. Siberia. Possibly a local form of *alternata*, as STAUDINGER considers some Amurland specimens intermediate.

C. alternata Müll. (= *alchemillata* Schiff. nec L., *sociata* Bkh., *subtristata* Haw., *contristata* Don.) (10 b as *sociata*). The differential characters have been given above, under *rivata* and *supergressa*. *alternata* is in many localities

degenerata. a very constant species but interesting aberrations and local races are known. — ab. **degenerata** Haw. (= *kurzi* *cingulata* Hirschke) has the median band very much narrowed, commonly broken. — ab. **cingulata** Tgst. has the abdomen *obscurata*. black, the hindwing also somewhat darkened. — **obscurata** South has the ground-colour less pure white, the dark markings of the forewing all dull brown, the dividing-line of the outer pale band always as dark as the *islandica*. rest of the markings. The median band of the forewing is much spotted with black. Hebrides. — **islandica** *form. nov.* somewhat resembles *obscurata* but is of a more smoky brown, at the same time much more glossy, the median band not spotted with black, the postmedian pale band of the forewing in general less sharply defined, the radial and median veins sometimes strongly darkened where they cross this band; distal area in *dubiosata*. general somewhat blurred. Iceland, apparently the prevailing form, at least in some localities. — **dubiosata** Alph. somewhat resembles *obscurata* but is larger, brighter brown, this colour also extended to the hindwing; median band not spotted with black, the white band beyond rather broader and clearer than in *obscurata*. Thian-shan, Issyk-Kul, Ferghana. — Larva in its earlier stages greyish green, somewhat rugose laterally; full-fed it is brown, mottled and variegated; thorax and posterior segments with a dark dorsal line; the first 5 abdominal segments with arrowhead-shaped dark markings, bordered interiorly with whitish. On Galium. The pupa hibernates. The moth flies in May-June and a second generation from the end of July. Abundant in most parts of Europe, except the extreme south, also recorded from Transcaucasia, Mongolia, E. Siberia, etc. and common in North America.

placida. **C. placida** Btlr. (8e) on account of its longer palpus and mimetic resemblance to *Abraxas* should perhaps constitute a separate subgenus, but it shows the characters of *Epirrhoë* as here given. Very variable. As a matter of fact BUTLER's type specimen was a unique aberration, with the terminal row of black spots on both wings entirely suppressed and the subterminal (especially on the hindwing) weakened; median band less broad than in our figure. — ab. **propinqua** Btlr., to which, strictly speaking, our figure belongs, has both the outer series of spots strongly developed, the median band broad. — ab. **evanescens** Btlr. has the outer spots on an average somewhat smaller, a few of them often obsolete, but differs chiefly in the median area; the discal spot is free, or almost free, preceded by one or two short marks on the costa and followed by an extended clear area; then follows a strongly curved postmedian line, accompanied distally by some large black spots and becoming lost in other large black spots in the posterior half of the wing. — Distributed in Japan.

Subgenus *Perizoma* Hbn. (= *Emmelesia* Steph.) Small moths. Face smooth-scaled, little prominent. Palpus moderately stout, generally rather short. Forewing with areole double, the distal one ample, 1st radial stalked. Hindwing with discocellulars biangulate (but see *fumataria*). Larvae chiefly feeding in seeds.

taeniata. **C. taeniata** Steph. (= *arctata* Zell., *albimaculata* Frr.) (81). Differs from typical *Perizoma* in its much longer palpus and somewhat differently formed ♂ genitalia with the "gnathos" wanting. Very variable in size and colouring etc.; the large white or whitish spot in the middle of the distal margin distinguishes *taeniata* and it, nearest allies from the more typical *Perizoma* species. Under surface rather weakly marked. — ab. *latefasciata*. **latefasciata** Strand. Median band broader than usual, fully one-third as broad as the length of the wing. — ab. **angustifasciata** Strand. Median band narrowed, only about one-sixth as broad as the length of the wing. — **saxea** Wileman, the Japanese race, is also very variable, but is in general darker, especially the hindwing, which is dark fuscous, almost or altogether unmarked; the median band of the forewing is broader (about as in ab. *latefasciata*) and shows a distinct projecting tooth distally near the costa. — Larva short, reddish or yellowish-brown with wedge-shaped black and lozenge-shaped brown dorsal spots on the earlier segments, posteriorly paler; a pale lateral stripe. On the capsules and spores of a moss, but will also accept the leaves of some low plants — dandelion, etc.; hibernates and is full fed in May. The moth flies from the end of June to August. Local in Northern and Eastern Europe and the Alps. Probably the Amur and Ussuri forms belong to subsp. *saxea*.

vinculata. **C. vinculata** Stgr. (81) differs from *taeniata* in its paler ground-colour, somewhat differently shaped band and whitish grey, unmarked hindwing. Koko-Nor and the Amdo district.

promptata. **C. promptata** Püng. Forewing slightly narrower, white, the basal patch, narrow median band and distal area brown-grey, subbasal band paler brown-grey; the white subterminal line, as in the two preceding, forms a W-shaped projection proximad on the 3rd radial and 1st median, but is more sharply defined. Hindwing white with small discal dot, dark spot near anal angle and dark terminal line. Discocellulars only weakly angled. Koko-Nor.

minimata. **C. minimata** Stgr. is related to *taeniata* but differs in its diminutive size (about 12–15 mm), narrow, almost straight light brown band between the basal and median bands and especially in the sharply black and white chequered fringe; the median band is of moderate breadth, shaped somewhat as in *vinculata*. Hindwing dirty dark grey, beneath with a dark discal dot followed by a broad dark, white-bounded line. Discovered at Vladivostok in July.

C. affinis Moore (= *fulvimacula* Hmps., *promiscuaria* Leech, ? *constricta* Warr.) (13 m). On an average *affinis*. larger than *taeniata*, the light brown parts of the forewing duller, much more mixed with fuscous, the antemedian line angulated in the middle, the postmedian commonly marked with more conspicuous black dots or short teeth on the veins; median band generally of moderate breadth, not very conspicuous, on account of the darkening of the adjacent parts: distal area white, a yellow-brown mark (generally long and narrow, pointed proximally) in place of the white mark of *taeniata*. Hindwing shining white, slightly greyish-tinged proximally towards the inner margin; a small discal dot and a postmedian line, the latter chiefly or only marked as dots on the veins. MOORE's type from Darjiling may represent a local race — rather clearer fulvous, with dark median band and broader fulvous mark in middle of distal area. The *fulvimacula* form, from Dharmsala, Chiating-fu, Chang-yang, etc., is not in general very variable.

C. exhausta *sp. nov.* resembles *affinis* (*fulvimacula* form) in colour but is smaller (about as *taeniata*), *exhausta*. relatively rather shorter-winged, the median area rather narrower, not appreciably marked with black excepting the discal dot and the costal end of the antemedian and postmedian lines, the antemedian strongly curved but scarcely angulated, the yellowish distal streak wanting, only this part of the distal area very vaguely paler than the rest; distal margin with pairs of indistinct dark dots (in *affinis* more distinct). Hindwing white, unmarked, only with very feeble suggestion of a discal dot and of a grey spot at the anal angle. Forewing beneath uniformly smoky, hindwing dirty whitish with small but distinct discal dot and 2 very indistinct lines beyond. Altogether a very weakly marked species, the median band scarcely differentiated in colour from the rest of the wing. Quite different in colour from *variabilis* and without conspicuous dark basal patch. Antennal ciliation minute. Koko-Nor, Tibet, type ♂ in coll. PÜNGELER.

C. seriata Moore (7h). Closely related to *affinis* but with a large pure white spot in distal area and *seriata*. large white dots representing subterminal line. The ground-colour is more reddish brown than in *taeniata*; median band variable in colour (red-brown, darker brown or black). Hindwing also variable, whitish to grey, always weakly marked. Dharmsala to Tibet and Sikkim.

C. albofasciata Moore (7h). Very distinct in having the median area of the forewing strongly mixed *albo-* with white, the dark median band being very shadowy. Dharmsala and other N. Indian localities. *fasciata*.

C. variabilis Warr. (13 m). Smaller than *seriata* and *affinis*, very different in aspect on account of *variabilis*. its strongly glossy, violet-grey tone. The basal patch is represented by a very conspicuous dark subbasal bar (narrow band) or is sometimes complete, the median area, on the other hand, is scarcely indicated except by the fine dark lines which limit it and which thicken somewhat on the costal and posterior margins; narrow, indistinct reddish-brown bands often bound the central area; a variable pale patch in middle of distal area. Hindwing usually whitish. Very variable. — *ab. albimacula* *ab. nov.* has the pale patch in the *albimacula*. distal area large and quite white. At Dharmsala it perhaps constitutes a local race, the median area very slightly darkened, the hindwing grey. — N. W. Himalayas, Sikkim, etc.

C. mediangularis *sp. nov.* (= *schistacea* Leech nec Moore) (12 c). Nearly as strongly glossy as *variabilis* *median-* but with a slightly more reddish-brown tinge, especially in distal area, and with scattered bluish scales, *gularis*. especially towards the margins. ♂ 26 mm, ♀ 32 mm, thus larger than *variabilis*, rather longer-winged. Head and body fuscous, with a whitish dorsal dot at base of abdomen. Forewing glossy fuscous, the basal and median areas somewhat darker, the distal slightly more red-brownish; subterminal line characteristic, bluish white, consisting anteriorly of elongate vein-dots, at the 3rd radial of a V-mark, pointing basewards (obsolescent in the ♂), posteriorly of smaller vein-dots. Hindwing like that of *affinis*, the white in some lights with slight bluish or violet reflections. Forewing beneath still more blurred, hindwing strongly dusted with fuscous. Nearest to *interrupta* Warr. from Sikkim. Omei-Shan (♂ type) and Pu-tsu-fong (♀ cotype) in coll. Brit. Mus.

C. fulvida Btlr. (= *punctilinearia* Leech) (7 k, as *punctilinearia*) closely resembles a less dark-dusted *fulvida*. form of *affinis* with the basal patch a little larger, the proximal edge of the median band regularly curved rather than angled, the band darker in its proximal half than in its distal, etc. Yokohama.

C. variaria Leech (13 m). Scarcely larger than *taeniata*, closely similar to *fulvida*, perhaps slightly *variaria*. broader-winged and with a strongly glossy grey tone recalling that of *variabilis*. Hindwing rather paler than in *fulvida*, usually with the discal dot and postmedian line well expressed. I can find no other reliable differences and it is possible that *variaria* may be another local race of *affinis* or *fulvida*. Pu-tsu-fong.

C. bipartaria Leech (7 k). Only the type specimen (a ♀) is known but appears to be a very distinct *bipartaria*. species of the *taeniata* group, with similar palpus; discocellulars only very weakly biangulate. The pale greenish,

black-edged basal area, very broad median band and almost equally dark marginal area, with only the beginning of a pale outer band (double line) will at once distinguish it. Pu-tsu-fong.

inconspicuar.

C. inconspicuar *Leech* (7h) has the costal margin of the forewing somewhat more rounded than in its nearest allies, yet is rather a narrow-winged species on account of the strongly oblique distal margin. Ground-colour darker; subterminal line sometimes only indicated by white dots at the 2nd radial and between the medians. Forewing beneath almost uniformly smoky, hindwing slightly paler than above. W. China: Ta-chien-lu.

orbata.

C. orbata *Püng.* does not appear very nearly related to any known species, but is by structure a *Perizoma*. Wings rather elongate, smoothly scaled. Forewing grey brown, a small basal patch and moderate median band rather darker, the latter of almost uniform breadth throughout, though somewhat angled outwards about the 1st radial; darker costal spots at the commencement of the antemedian and postmedian lines; a whitish, finely divided band beyond the central band, as in most *Perizoma*; an elongate black cell-mark; distal area almost unmarked, the subterminal line scarcely traceable. Hindwing white, with small inconspicuous discal dot. Koko-Nor.

fumataria.

C. fumataria *Leech* (7h) is perhaps a *Perizoma*, as indicated by WARREN, but the discocellulars are extremely weakly angled, in some examples not angled. Face and palpus about as in *taeniata*, anal clasps almost as strongly developed. Slightly narrower-winged, the median band differently formed; distal area weakly marked, but with the pair of spots between the radials generally fairly conspicuous. Chang Yang, Central

verticata.

China. — **verticata** *Warr.* seems to be a rather paler, less brownish grey race with paler grey hindwing, showing traces of curved lines. On the forewing there is an appreciable band in the middle of the pale subbasal area and a moderate amount of dark shading in the distal area. W. China.

affinitata.

C. affinitata *Steph.* (10f). The name-typical form of this species, as will be seen from our figure, is characterized by the narrow white postmedian band of the forewing and especially by the dark hindwing, with only a narrow, divided white or whitish band. I have seen rather extreme examples from N. and W. Germany, and rather less extreme from England and according to STAUDINGER it is distributed in Central and

rivinata.

Northern Europe and Roumania. — **rivinata** *Fisch.-Rössl.* (= *inciliata* *Zett.*, *turbulata* *Stndf.*, *turbaria* *Steph. nec Tr.*) (10f) has the white on the forewing much extended and the hindwing broadly or almost wholly white. It belongs chiefly to northern or mountain districts, but sometimes occurs as an aberration with the

magistraria.

type. England, N. Norway, the Alps, Carpathians, etc. — **magistraria** *Trti.* and *Verity* is larger, the forewing grey, not brown, but darker than in *hydrata* and with broader white band; hindwing greyish with double whitish band; underside like that of *rivinata*. Terme di Valdieri, Maritime Alps. — Larva stout, grey-brown, pinkish brown or pinkish grey with blackish head and prothoracic plate, dark anal plate and dark plate on the outer side of the anal proleg; lines darker pink; spiracles black. In the seed-vessels of *Lychnis*. Pupa thick, glossy, brownish ochreous with darker incisions; hibernates, and frequently passes a second winter. Imago in June and July, very rarely a partial second brood in August.

alchemillata.

C. alchemillata *L.* (= *rivulata* *Schiff.*, *nassata* *F.*) (10f). Very similar to *affinitata* but smaller, with clearer and more regular white marks at the hindmargin of the forewing, tendency towards obsolescence of the pale band on the dark hindwing; distal area of forewing with black dashes on the veins. Generally less

peterseni.

variable than *affinitata*. — **peterseni** *nom. nov.* (= *nassata* *Haw. nec F.*, *fennica* *Petersen nec Reuter*) has the white antemedian band well expressed; generally also the postmedian white band is somewhat widened and sometimes even a complete white subbasal is present. It is the prevailing form in Esthonia and perhaps in Scandinavia and is commoner in Scotland than in England, but occurs as an aberration in many localities. — Larva rather stout, head, prothoracic and anal plates shiny black, body longitudinally striped with red and green, rather variable but usually a very gay creature. It feeds in the seeds of *Galeopsis* and has also been recorded from *Stachys*, *Ballota*, *Lamium*, etc. It passes the winter as pupa. The moth flies in June and July, in southern localities partially double-brooded, and is common in the greater part of Europe, Asia Minor, Transcaucasia and the Altai.

fennica.

C. fennica *Reuter* is unknown to me and is a very enigmatical species or form. I have given reasons (*Trans. City Lond. Ent. Soc.* vol. 15 p. 28) for rejecting PETERSEN's determination of it. Size of *alchemillata*, more coffee-brown, more thickly scaled, more unicolorous (less traversed by wavy markings), the antemedian white band obsolescent, the postmedian undivided and not sharply bounded distally, its shape somewhat different, the discal dot surrounded by some whitish scales, the terminal line in the ♀ almost obsolete. Finland, only one of each sex known.

hydrata.

C. hydrata *Tr.* (10g). Slightly longer-winged than *alchemillata*, paler and more greyish brown, hindmargin of forewing without the conspicuous white marks, the white postmedian band narrower and duller, the subterminal

line uninterrupted, in places rather deeply lunulate. — *fasciata* Trti. and *Verity* is darker grey with the white *fasciata*. bands better marked, more complete. Pyrenees and Maritime Alps. — The larva is stumpy, reddish yellow with the segmental incisions lighter and sometimes with indications of reddish longitudinal lines; head dark brown. In seed-pods of *Silene nutans* or occasionally *S. inflata*. The pupa hibernates. Local and uncommon in Central Europe, Russia, Armenia, etc., flying in May and June. — *flexuosaria* Boh., founded on a single ♂ from Blekinge, *flexuosaria*. S. Sweden, recorded also from Carniola, is treated by STAUDINGER as probably a form of *hydrata*, by AURIVILLIUS as a species. Smaller and paler than typical *hydrata*, genitalia distinguishable. LAMPA compares it with the ♀ of *affinitata rivinata* but says that the dark central band is brown-grey, not yellowish, its distal projection between the medians broadly lanceolate, not blunted at the tip, a pointed tooth also noticeable near the hindmargin; terminal line broken up into dots; fringe apparently not white-spotted; hindwing nearly white, with 2 indistinct greyish bands.

C. lugdunaria H.-Sch. (13e). Closely similar to *hydrata* but with the costal margin of the forewing *lugdunaria*. more strongly arched before the apex; brown-grey, subbasal and antemedian stripes straight, dentate, the latter ending in a blackish spot on the hindmargin; the dentate whitish band distally to the postmedian is obsolete in the posterior half; apex divided by two thick white teeth; subterminal line indistinct. Hindwing with very indistinct pale postmedian band. Very local, S. France, the southern part of Austria-Hungary, Sarepta.

C. bifasciata Haw. (= *scitularia* Rbr.), as described by HAWORTH, is the lighter, more sharply marked *bifasciata*. form of this species, the ground-colour being cinereous while both the bands (subbasal and median) stand out sharply in fuscous. RAMBUR's *scitularia*, from Corsica, seems to be synonymous with this varied form. — ab. **unifasciata** Haw. (= *aquilaria* H.-Sch., *linolata* Guen.) (10g, as *bifasciata*) is darker, the subbasal band in *unifasciata*. consequence scarcely differentiated, the median band still darker and rendered prominent by the white line which follows it, often also by one which precedes it. — **euphrasiata** Mill. (= *odontata* Mill.), described from *euphrasiata*. Alpes Maritimes as a variety of *bifasciata* or perhaps a distinct species, is quite different from any form which I have seen, the figure almost more recalling some forms of *minorata*. Smaller than the name-type, ground-colour whitish, the brown central band of about the same width as in *minorata* but with rather dentate edges, a distinct waved line proximally to the subterminal, the fringes with distinct dark dots on the hindwing only. — Larva on *Bartsia*, at first burrowing into the seeds, but later resting on the outside; it is stout, attenuated at both ends, in its adult stage brownish or brown-grey, sometimes tinged with green, dorsal line grey, subdorsal ochreous or whitish, with a rather oblique dark grey dash at each segmental division; lateral stripe broad, whitish, dark-edged. It pupates in the late autumn. Pupa short and stout, greenish yellow with abdominal segments red-brown. It does not emerge till the following July or August and frequently remains two, or more rarely even three or four winters in the pupal state. RAMBUR gives June for *scitularia* on Corsica. Central and S. Europe.

C. parvaria Leech (= *ablegata* Stgr.) (7k) somewhat recalls a small *bifasciata* ab. *unifasciata* but differs *parvaria*. from all the allied species in the 5 or 6 not dentate white lines on the black-grey or brown-blackish forewing. Forewing beneath blackish grey, the outer lines of the upper surface weakly reproduced, only at the costa whitish; hindwing lighter than forewing, with dark discal dot, postmedian line and an ill-defined band before the lighter distal margin. Discocellulars very feebly angulated. Palpus rather short. Japan?), Amurland and Korea.

C. haasi Hedem. (10f) is a very distinct species, with long, strong palpus. The sharply whitish sub- *haasi*. basal band, large dark discal dot and waved dark line on the hindwing beneath are mentioned as distinctive; the specimens which I have seen have broad white bands on both sides of the median band, the band differently shaped, both it and the basal patch mixed with white, etc. It is, however, said to be tolerably variable. Amurland.

C. contrita spec. nov. Perhaps near *haasi* but with the palpus normal (about as in *bifasciata*), the wings *contrita*. somewhat more fully rounded, the discal dot of the forewing obsolete, the markings more blurred, the median band being scarcely black-edged except at the costal and posterior margins and the white areas vaguely suffused with brownish; proximal area of forewing more as in *bifasciata*, though less sharply marked, median band narrowing at hindmargin, becoming black at the margin itself; subterminal line interrupted, apical dash fairly apparent. Hindwing above uniform dark smoke colour, beneath much more weakly marked than in *haasi*, the postmedian band being less white and the dark line which bounds it proximally almost obsolete. ♂ antenna (as also in *bifasciata*, etc.) very minutely ciliated (in *haasi* much less minutely). Central Amurland (KORB), type ♂ in coll. PÜNGELER.

C. minorata Tr. (10g) is another inconstant species and shows some local and some individual *minorata*. variation. The name-typical form, as it occurs in the Alps, the mountains of Germany, Austria, S. France, etc., is the larger, paler race, the ground-colour being clear white, the markings often paler than in our figure,

- ericetata*. the distal area at times with only quite weak dark shading. Hindwing whitish or very pale grey. — **ericetata** Steph., the only form known to me from Scotland, is considerably smaller, darker-marked, the white band distally to the median generally with a sharper dividing-line, the hindwing darker grey. — **norvegica** Prout, from Norway, is as small as *ericetata* but otherwise forms a strong contrast to it, being more weakly marked than the name-type. — ab. **monticola** Strand is a rare aberration, with the median area not darkened at all, but only indicated by the lines which limit it. Mentioned from Norway and Scotland. — The larva is stout, tapering at the extremities; pale green or yellow-brown, with yellow-brown or paler dorsal stripe, divided by a dark mediodorsal line and also edged by dark lines; a pale lateral stripe, sometimes reddish bordered; head, prothoracic and anal plates brown. In the seed-vessels of *Euphrasia officinalis*. The pupa hibernates and is yellow, with the segment-incisions brown and the wings green. *minorata* flies from the end of June to August, in Scandinavia, Scotland and the mountains of Northern and Central Europe.
- blandiata*. **C. blandiata** Schiff. (= *adaequata* Bkh., *derasata* Schr.) (10 g). Related to *minorata* but with the band between the basal and median obsolete or very shadowy (extremely pale brown) the median band very dark anteriorly but pale in the middle, except on the veins, the hindwing rather more strongly marked. — ab. *coarctata*. **coarctata** Prout has the median band narrowed to a mere thread. — **perfasciata** form. nov. has the median band dark throughout and appears to form a constant local race in the Hebrides. — The larva is similar to that of *minorata*, very variable but in general more brightly green with crimson or purple markings and yellow lateral ridge. In the seeds of *Euphrasia officinalis*. Pupa yellowish green with a crimson dorsal line; hibernates. Imago in June and July, chiefly in mountain districts. Central and Northern Europe, N. Italy, Croatia, Brusa, Armenia and the Changai Mountains.
- albulata*. **C. albulata** Schiff. (= *ablutata* Ev.) (10 g). Related to the two preceding, on an average larger, the markings much weaker, brown. In the name-type the ground-colour is white and the markings quite indistinct, light brown or grey-brown, the median band scarcely indicated except by transverse lines. Our English race is less pure white, generally somewhat suffused with greyish or yellowish, but scarcely needs a separate name. — ab. *griseata*. **griseata** Stgr. indicates the more extreme examples of this English race, in which the greyish tone of the markings becomes more pronounced and there is even some admixture of fuscous; the ground-colour remains white, but the hindwing is greyish. — *subfasciaria*. **subfasciaria** Boh. is a small yellowish-grey or brownish-grey form, in general weakly marked, and occurs in some of the Scandinavian mountains and in the Shetland Islands. — ab. *tnules*. **tnules** Weir is merely an extremely darkened aberration of *subfasciaria*, perhaps found only in the Shetlands. — *dissoluta*. **dissoluta** Strand, from Arctic Norway, is paler than the type, perhaps on an average smaller, but not so small as *subfasciaria*. It occurs also as an occasional aberration in the Swiss Alps, Bucovina and Roumania. — ab. *hebodium*. **hebodium** Weir (= *niveata* Steph. nec Scop., *hebrideum* Robs. and Gardn.) is a pure white, markingless aberration of exceedingly rare occurrence except in the Hebrides, where it is comparatively frequent. Transitions have been recorded from the Caucasus, N. Persia, etc. — Larva stout, tapering; head, prothoracic and anal plates black or dark brown; greenish white or pale yellowish, sometimes with darker dorsal stripe. In the seeds of yellow rattle. Pupa stumpy, yellow, hibernating in a stout cocoon, not rarely passing a second winter. The moth flies in May and June and occurs in most parts of Europe and in Transcaucasia.
- maerens*. **C. maerens** Stgr. Smaller than *albulata*, unicolorous dark (blackish) smoke-brown, the forewing with 2 obsolete, scarcely recognizable lighter lines in the distal part, the underside, especially of the rather long hindwing, with inconspicuous darker discal lunules. Palpus strikingly longer and more densely scaled beneath than in *albulata*. Described from Samarkand. I have before me an example from Transcaspia, in which the areole seems to be single; if this be so, it is no *Perizoma*.
- flavo-fasciata*. **C. flavofasciata** Thrb. (= *decolorata* Hbn.) (10 h). Larger than most of the subgenus, distinguished at once by the light sand-coloured markings. — Larva stout, tapering; head, prothoracic and anal plates brown; body dull reddish, in the middle of the dorsal area with a pale band; lateral stripe whitish; ventral area pale with small brown spots. The pupa hibernates. The moth flies in June and July; it has a pretty wide distribution in Europe and is also recorded from North Africa.

Subgenus *Hydriomena* Hbn. (= *Ypsipetes* Steph.). Moderate-sized moths. Face rather prominent, scarcely tufted. Palpus stout, moderate or long ♂ antenna rather thick, minutely ciliated. Forewing with costal and distal margins curved, apex squared, distal margin commonly shorter than hindmargin; areole double, 5th subcostal generally arising from apex of distal areole, 2nd subcostal near it. Hindwing with discocellulars strongly biangulate. Larva stout, living in spun-up leaves. Biologically and in habitus one of the most natural subgenera (or genera), better recognized by the pattern (basal patch minute, a subbasal line very oblique, no definite median band or subterminal line, etc.) than by any salient structural characters. The shape is generally distinctive.

C. furcata *Thnbg.* (10k) is infinitely variable, but differs from the other European species in the shorter palpus, the more angled or irregular markings between the subbasal line and the median space, dark subterminal band, nearly always interrupted by a white or pale spot in the middle, absence of black vein-streaks near the apex, etc. The name-type is cinereous with dark bands. *tacetaria* *Frr.* may be synonymous with it but has the distal area weakly marked. The figure is bad. — ab. **cinereata** *Prout* is cinereous without the dark bands. — ab. **sordidata** *F.* is green with dark bands. — ab. **obliterata** *Prout* is green almost unmarked. — ab. **fuscoundata** (*Don.*) *Stgr.* (10k) is testaceous or reddish with dark bands and only seems to occur among the bilberry- or heather-fed forms. — ab. **testaceata** *Prout* is testaceous without the dark bands. — ab. **obscura** *Peyer.* (= *infuscata* *Stgr.*) (10k, as *infuscata*) is unicolorous fuscous or nearly so. — ab. **tricolorata** *Schr.* (= *albifasciata* *Prout* nec *Pack.*) differs from ab. *sordidata*, which it otherwise resembles in coloration, in having a pale grey or white median band. — ab. **irrorata** *Spr.* is large and broad-winged, strongly irrorated, 4th and 5th bands incomplete. — ab. **constricta** *Strand* has the pale central area broken into separate rounded spots. — ab. **nexifasciata** *Btlr.*, from Japan, closely resembles ab. *sordidata* but has the third dark band (antemedian) broader, less sharply angulated, the white spot in the middle of the distal area obsolescent. The winter is passed in the egg state. Larva stout, reddish grey with brown head, dark brown prothoracic plate, indistinct dark dorsal line, broad white subdorsal, pairs of whitish spots at the segment-incisions and inconspicuous whitish lateral lines; venter greyish green. In lowland districts it feeds chiefly on willow and hazel; the smaller mountain race feeds on heather and bilberry. Pupa glossy, reddish-brown with the wing-cases darker. Moth in July and August, the small race in some localities already in June. Extremely abundant in Northern Europe; in Central Europe it becomes more local and in the south it is apparently almost wanting; in Siberia and Central Asia it has a wide range. Also recorded from North America.

C. coerulata *F.* (= *autumnalis* *Ström*, *trifasciata* *Bkh.*, *impluviata* *Hbn.* nec *Schiff.*, *bicommata* *Schr.*) (10k, as *autumnalis*). Palpus long, but not quite so long as in *ruberata*; otherwise individual specimens of the two species sometimes bear a very close resemblance. *coerulata* is perhaps on an average slightly smaller, is somewhat shorter-winged, oftener with a very pale, blue-green median band, the oblique subbasal line is straight, or only very weakly angulated in the cell, the black marks on the hindmargin of the forewing and on the anterior veins distally, which generally characterize both species, on an average less strongly developed than in *ruberata* but very variable in both species. Our figure well illustrates the typical form. — ab. **literata** *Don.* has the proximal and distal parts of the forewing duller, more rust-coloured, the median band whitish. Possibly only founded on somewhat discoloured specimens. — ab. **obsoletaria** *Schille* (= *infuscata* *Prout*, *cine-rascens* *Strand*, *nigrescens* *Huene*) has the forewing almost uniformly dark cinereous or fuscous. — ab. **semi-fuscata** *ab. nov.* has the median band mostly infuscated, except at mid-costa, but the narrow pale green bands which bound it remain unaltered. I have only seen it from Arran. Transitional towards the preceding. — ab. **arctica** *Paux* is scarcely intelligibly described: "markings of forewing maroon violet and rosy yellowish". — ab. **constricta** *Strand* has the median area of the forewing constricted, interrupted. — The larva is similar to that of *furcata* but with the pale markings less white; according to BUCKLER's figures (which are generally very reliable) the setae are much longer. Feeds in curled-up leaves of alder from July to September or October. The pupa is black with short, wedge-shaped cremaster, and commonly remains spun up in the larval habitation after this has fallen to the ground. The moth appears in May and early June and there is sometimes a very partial second brood about August. Its range is similar to that of *furcata* but it is not known from Iceland.

C. ruberata *Frr.* (= *fulvoundata* *Fuchs*, *autumnalis* *Stichel* nec *Ström*) (10k) is distinguishable from the preceding species by the characters noted above and the greater prevalence of reddish or rust-coloured tone. Subbasal line variable, often strongly angled in the cell, sometimes thickened at the angle and again at the hindmargin; antemedian rust-coloured band often ending in a conspicuous black spot at hindmargin; in the distal area the black line on the 1st radial is generally strong, those on the 5th subcostal and 2nd radial rarely so; black apical streak generally conspicuous. The name-type is grey, sharply marked, with the rust-colour reduced to 4 narrow, inconspicuous bands. — ab. **variegata** *ab. nov.* (10k) is more intensively marked with rust-red and black, first and second bands nearly confluent, sometimes some red suffusion in median area. — ab. **grisescens** *Huene* (= *cine-rascens* *Stichel* nec *Strand*) is a weakly marked grey form with no rust-red markings, median area not paler. It is frequent in the West of England. — Larva closely similar to that of *coerulata*, in general more greyish in colour and perhaps more weakly marked. In a chamber formed by spinning together 2 or 3 terminal leaves of a shoot of willow or uniting leaves to old catkins, gregarious at first but solitary later; in the Orkneys it has been found feeding on heather. Pupa glossy, very dark brown, segment-incisions paler, cremaster conical, rather short; in a loose cocoon among fallen leaves or under loose bark. The moth flies in May and June. It is very local, inhabiting Britain, Scandinavia, Russia, the Alps and some mountain localities in Germany and N. Hungary. Also in N. America.

promulgata. **C. promulgata** Püng. is probably referable to this group. Size of *coerulata* (*autumnalis*). Forewing broad, dull blackish grey with indistinct dark transverse markings, the basal area (obliquely bounded), the narrow median band and the shortly dentate, almost straight subterminal line whitish, in part grey dusted. Hindwing white with sharply marked discal dot and incomplete dentate dark outer line. Under surface whiter than in *coerulata*, similarly but more faintly marked, the terminal line only indicated on the forewing. Neuration and antennal structure as in *coerulata*, palpus much shorter and thinner. Koko-Nor.

Subgenus *Eorophila* Gmpbg. In shape and structure similar to *Larentia*, the ♂ antenna merely dentate, with tufts of very short cilia at the ends of the teeth, both wings with apex rather less sharp and distal margin rather less straight. Differs from nearly all *Cidaria* in the crenulate distal margin of the hindwing and probably in the larva.

badiata. **C. badiata** Schiff. (10 m) is very variable but may be known at once by the shape and structure, the shape of the lines, the black apical streak and the small but very conspicuous white subterminal spot. We must regard as the name-type the form figured by HÜBNER, which has the ground colour of the forewing rather uniformly yellowish-brown, distally rather more reddish, the median area not lighter. — ab. *pallida* Lambill. is paler, basal area little darkened, distal not darkened, median band whitish, without a blue-grey spot distally to the cell. — ab. *rectifasciaria* Lambill. has the pale median area one-third broader than usual, not traversed by lines, the lines which bound it sharply marked. — ab. *alpestris* Neuburger, from the Tyrol, (at 3400 m) has the median area brown, the distal moderately darkened, no pale part; hindwing also somewhat browner. Perhaps little different from HÜBNER's form. — ab. *subbadiata* Strand (= *ocellaria* Bodart). Median band pale, narrow, interrupted in the middle, the posterior part sometimes broken up into spots. — Larva elongate, cylindrical; head rounded, distinct, orange with a large black spot on side; body very variable in colour dorsally, green, purple or slaty grey, a dark spot on side of prothoracic leg, another dorsally on 10th abdominal segment, dorsal tubercles white, lateral tubercles black. On rose in May and June. Pupa rather stout, dark glossy red-brown, anal segment black, cremaster short and thick. Moth from March to the beginning of May. Central and Eastern Europe, the Altai and Tarbagatai Mountains.

60. Genus: **Zola** Warr.

Differs from *Cidaria* chiefly in the shape of the wings and their longer cells. Face with projecting cone of scales. Eye rather small. Palpus strong, with long hair-scales. Breast and femora hairy. Forewing with costal margin almost straight, apex subfalcate, distal margin prominent in middle, very oblique posteriorly, cell well exceeding one-half, areole double. Hindwing with costal margin rather long, apex prominent, distal margin somewhat sinuous, prominent in middle, cell one-half, discocellulars not biangulate.

Only one species is known, inhabiting Japan, etc.

terranea. **Z. terranea** Btlr. (12 c). Forewing rather dark reddish brown with some dark grey dusting, the costal and distal margins more grey; proximal area clouded, almost obliterating the first lines; postmedian marked with very short dark dashes on the veins; a similar but weaker line follows (also marked with dark dashes, especially on the 3rd radial and the medians) bounding the grey distal area. Hindwing rather paler, with discal dot and two lines beyond. — *undata* Stgr. (described as *Mesotype*) is a much lighter brown form, more tinged with clay-colour, the lines rather better defined. Both forms (which do not seem to intergrade) occur in Japan, *undata* also in the Ussuri district.

61. Genus: **Pelurga** Hbn.

Face convex, without tuft. Palpus moderate. Antenna in ♂ minutely ciliated. Thorax with horny rounded prominence anteriorly, crested posteriorly. Areole double. Hindwing with discocellulars biangulate. Both wings with apex well marked, and distal margin ventricose in the middle.

Only one species is known, characterized by the structure of the thorax. It has a wide range in the Palearctic Region.

comitata. **P. comitata** L. (= *chenopodiata* Hbn. nec L.) (10 m) may be known at a glance by its shape, the broad median band, sharply black-divided apex, etc. In the name-typical form the ground-colour of the forewing is ochreous. — In ab. *ferruginascens* Krulik, it becomes bright rust-reddish. — In ab. *moldavinata* Carad.

it is much darker and more unicolorous, the hindwing also darkened. This latter form, which is recorded from N. Germany, Roumania, the Ural, Ussuri, etc., is perhaps in some localities tending to form a local race. — ab. *zonata* *Wahlgren* has the median band entirely brown-black, ground colour normal. Larva stout, rugose laterally, segmentation distinct; ochreous brown; dorsum tinged with green and with a row of large V-shaped dark markings on the abdominal segments, pointing forward. On *Chenopodium* and *Atriplex*, especially on the flowers and seeds. Pupa very short and thick, densely sculptured with fine incised lines and punctures; dark red-brown; hibernating. Moth in June and July, distributed in Europe (except the South-west and the Arctic Region), Siberia, N. China, etc. *zonata*.

62. Genus: *Cataclysme* *Hbn.*

Closely related to *Cidaria* subgen. *Euphyia*, but distinguished by the remarkable neuration of the forewing; the distal areole is wanting, the 5th subcostal long-stalked with the 1st radial, remote from the other subcostals. In the typical subgenus, which inhabits the Palearctic Region, the ♂ antenna is nearly simple, as in *Euphyia*. Only a few species are known.

A. Antenna in ♂ very shortly ciliated.

C. riguata *Hbn.* (9i) is marked somewhat like *Cidaria bilineata* but even more uniformly and is very distinct in its shape and colour, etc. In the name-typical form the ground-colour is grey-brown, the white lines very fine, not very conspicuous. — ab. *millierata* *Gmpbg.* is described and figured as cinereous, brown-lined (dark blue-grey-lined in the figure), the median area of the forewing slightly darkened, the subterminal line of both wings better expressed, the underside distinctly marked. I have never seen anything approaching it. — *festivata* *Stgr.* represents *riguata* in the district which extends from Zerafshan to Ili and is larger, brighter brown, with the white lines more distinct. — Larva elongate, cylindrical, violaceous grey, weakly shaded in places with rosy; dorsal line fine, brown, interrupted at the incisions, subdorsal flesh-coloured, lateral line white, ventral band brown; the middle segments bear dorsally dark angular markings, pointing caudad. On *Galium* and *Asperula*. Pupa rather slender, shining red-brown, the wing-cases etc., rather more prominent than usual. Those of the second brood hibernate. Flies in May and in a partial second generation from July to September. The name-typical form inhabits South and southern Central Europe, Belgium, Asia Minor to Transcaspia and again in the Tarbagatai-Altai region. *riguata*. *millierata*. *festivata*.

C. dissimilata *Rbr.* (= *uniformata* *Bell.*, *dissimulata* *Stgr.*) (9i). Similar to *riguata*, perhaps on an average rather smaller, generally more tinged with yellow or greenish-yellow, a little more variegated, the median area and sometimes the basal appearing slightly darkened, at least at the boundaries; indications of double pale lines proximally and distally to the median area; distal edge of median band more strongly dentate; subterminal line often obsolescent or indicated only by white vein-dots; terminal line black, dotted with white at the veins. — *spissistrigaria* *Trti.*, according to specimens lent by Herr PÜNGELER, seems to be nothing more than a rather dark form of this species, greyish fuscous with the pale waved lines and whitish subterminal dots rather well expressed. Aritzo, Sardinia. — Larva less slender than that of *riguata*, flesh-colour or sometimes greenish, with numerous fine dark longitudinal lines and white lateral stripe, the middle segments with blackish dorsal triangles. On *Galium*. The pupa hibernates. There are two broods, flying in April–May (or June) and August–September. S. France; Spain; Corsica. *dissimilata*. *spissistrigaria*.

C. multistriga *Ob.* possibly belongs here but is quite uncertain as the figure is accompanied by no descriptive matter, even the sex not indicated. Rather larger than *dissimilata*, forewing perhaps more elongate, ground-colour whiter, the markings therefore sharper, otherwise similar, median band with rather strong indentations proximally, postmedian white band of hindwing nearer the margin, subterminal obsolescent, not broken up into dots. Underside similar to that of *scripturata*, rather more sharply marked, terminal line broken up into pairs of dots. Constantine, Algeria. Perhaps a *Cidaria* (e. g. of the subgenus *Euphyia*). *multistriga*.

B. Antenna in ♂ strongly dentate with fascicles of cilia.

C. plurilinearia *Leech* (7i) is one of the largest species of the genus, grey, in places yellowish-grey, not brown, the markings, at least on the hindwing, stronger than in the species of section A, a discal dot present on the hindwing; distal margins more appreciably crenulate. Underside still more strongly marked, with pale postmedian band, sharply dark-edged proximally. Ni-tou, W. China. *plurilinearia*.

C. Antenna in ♂ bipectinate. (*Paraplaneta* Warr.)

conturbata.

C. conturbata Walk. (131). Larger than *riguata*, slightly narrower-winged. Nearer to *plurilinearia* but not so large, the fore-wing with a distinct discal dot (in *plurilinearia* only present on the underside), the distal edge of the median band more excised at the 2nd radial, the narrow band which follows it paler. The under surface is very distinct, being much darker, both wings with clear white postmedian band, the forewing with a white or pale line between the discal dot and postmedian band, the proximal area of the hindwing more or less mixed with whitish or traversed by ill-defined whitish lines. Pectinations short, transitional to those of *plurilinearia*. N. W. Himalayas.

obliquilineata.

C. obliquilineata Hmps. (13 m). Antenna in ♂ with longer pectinations. Forewing with apex more produced, distal margin more oblique. Ochreous white, slightly irrorated with fuscous, the lines brown fuscous. Forewing with indistinct double oblique subbasal and antemedian lines, small cell-dot (sometimes obsolete) and 6 almost straight oblique lines between this and the distal margin, the 3rd the most conspicuous, proximally suffused with ochreous, edged distally by a white line. Hindwing with 6 oblique lines, all obsolete anteriorly. Underside more suffused with fuscous, the lines on the hindwing more prominent than above. N. W. India: Kulu, etc.

D. ♂ unknown.

grandis.

C. grandis spec. nov. (12 b). ♀ 40—50 mm. Very distinct in its large size, reddish fawn-colour and very broad median area. Apex of forewing minutely produced, distal margins (especially of hindwing) slightly crenulate. Underside rather less reddish, sometimes paler distally to the postmedian line, the veins alternately dark- and light-dotted; both wings with small discal dot. Guimar, Teneriffe (W. Walmesley WHITE), February. Type and cotype in Oxford Museum.

63. Genus: **Apithecia** gen. nov.

Face tufted. Palpus rather long and strong. 3rd joint relatively small. Antenna in ♂ bipectinate. Legs normal. Abdomen crested. Forewing with areole double. Hindwing with discocellulars oblique.

Type of the genus: *viridata* Moore (*Cidaria*).

Distributed in India. I know only the one species. It is intermediate between *Xanthorhoë* and *Eupithecia*, the shape, etc., resembling the former, the abdomen even more strongly crested than in the latter.

viridata.

A. viridata Moore (13 e). Easily recognized by the structural characters, the green forewing with purple-fuscous markings and the ochreous-whitish hindwing. The former is less, the latter more strongly marked beneath. W. China: Omei-shan and Ni-tou. Also in India and Formosa.

64. Genus: **Venusia** Curt.

Face broad and smooth. Palpus short and slender. Antenna in ♂ shortly pectinate. Hindtibia with all spurs. Forewing with areole single; 3rd discocellular very oblique. Hindwing with discocellulars biangulate.

This genus and those which follow (as far as *Asthena*) form a closely related group on which WARREN has founded a separate subfamily *Astheninae*. They are small, delicately built moths, in wing markings as well as in the structure of the head and sometimes (*Cambogia*) the forewing neuration resembling Acidaliids. They inhabit the Palearctic and Nearctic Regions and New Zealand.

cambrica.

V. cambrica Curt. (= *erutaria* Bsd., *nebulosaria* Frr.) (9 d). Quite distinct. The black marks on the 3rd radial and 1st median distally to the outer line recall *Oporinia*. English specimens and (according to HERZ) the Korean form are on an average rather less white, than those from Scotland and continental

pygmaea.

latefasciata.

webbi.

In general the ♀ is slightly larger and paler than the ♂. — ab. **pygmaea** Tysstr. is small with the central area constricted. — ab. **latefasciata** Strand has the median area very broad, the lines which bound it are parallel, not approximated in the posterior part. — ab. **webbi** Prout has the markings almost obliterated excepting at the costal margin and on the median vein and its branches, recalling *Oporinia autumnata gueneata*.

bradyi.

lofthousei.

— ab. **bradyi** Prout (= *nigricaria* Rbl.) has both wings uniformly suffused with dark smoke-colour, and is becoming frequent in the Sheffield district. — ab. **lofthousei** Prout is a quite different melanotic form from ab. *bradyi*; forewing suffused with smoke-colour but remaining longitudinally rayed with white in the distal area, hindwing not infuscated. Only known from North Yorkshire. — Larva of moderate thickness, the segments

somewhat swollen laterally, the incisions deep; head light brown, body green with yellowish subdorsal line and lateral stripe and with variable red spots or blotches, especially on and above the legs. On mountain ash (*Pyrus aucuparia*). Pupa hibernating; rather stout, tapering rapidly posteriorly; reddish brown, the wings green. The moth emerges in July and is found by day sitting on tree-trunks. It is local in Northern and Central Europe, Russia, the Altai, Japan and across North America from Anticosti and New York to Vancouver Island.

65. Genus: **Atopophysa** Warr.

Differs from all the rest of the group in having the palpus rather long and strong, but the shape, scaling and markings seem to indicate that it really belongs here rather than to *Cidaria*. Antenna in ♂ simple, anal claps strongly developed. Areole double; 3rd discocellular of forewing very oblique. A bladdery fovea present on the ♂ forewing beneath. Discocellulars of hindwing biangulate.

Only one species known, inhabiting Northern India and China.

A. indistincta Btlr. (= *naparia* Leech, ? Ob.) (13e, 8b, as *naparia*). Glossy grey, sometimes with tinge *indistincta*. of purple-brown. Forewing with fine dark, little curved subbasal line, parallel antemedian and 4 postmedian, sometimes rather ill-defined except at the veins and at the hindmargin, forming narrow bars or bands, the postmedian commonly black-marked at the radials, 2 dark subterminal lines, an oblique, interrupted black mark from the apex and usually dark subterminal spots between the radials. Hindwing with inner margin rather long, distal margin slightly subcrenulate, not or scarcely convex from the 2nd subcostal to 3rd radial; paler than forewing, with weak double postmedian and subterminal lines, darkest at inner margin. Under side weakly marked. A variable species in the strength of the markings. Dharmsala and China (Omei-shan to Ningpo), as well as at Simla and the Khasi Hills.

66. Genus: **Hydrelia** Hbn.

Face smooth. Palpus short, shortly scaled. Antenna in ♂ ciliated. Hindtibia with all spurs. Forewing with areole single, often small. Hindwing with discocellulars not biangulate, 1st median usually free, exceptionally (*nisaria* and *bicauliata*) stalked.

The larvae (so far as known) are moderate or thick, with strongly marked segmentation and with the head small; they live on trees.

Distributed in the Palearctic and Indo-Australian Regions and in North America.

A. Distal margin of hindwing not strongly crenulate (*Hydrelia*).

H. nisaria Chr. (13e) may be known by its diminutive size and by its neuration, which is almost *nisaria*. like that of *Cambogia*. Colour rather variable, similar to that of *testaceata* but appearing rather darker and more brownish, chiefly because the lines are rather thick and strong. Postmedian brown line (band) of forewing marked with black dashes on the veins; postmedian line of hindwing thick. Black discal dot of forewing conspicuous. S. E. Siberia, Korea and Japan.

H. parvulata Stgr. is at least as small as *nisaria*, but with broad white outer band, white line at distal *parvulata*. margin, etc. Not quite so broad-winged as *testaceata*. Neuration normal. Forewing mixed grey and brownish, with narrow white subbasal and broader white postmedian bands, indistinctly dark-divided; median band with a blunt distal projection in the middle and containing a large black discal dot and partly broken by whitish dots or interrupted lines; distal area also partly interrupted with white markings, especially in its posterior part; terminal black streaks separated from the dark distal area by a sharply white line; fringe dark, narrowly intersected with white at the vein-ends, at the apex whitish. Hindwing whitish, with 3 approximated dark lines in the middle; basal and distal areas more or less darkened. Forewing beneath grey, with black cell-dot and rather broad whitish postmedian band; of hindwing white, with cell-dot and weak grey band, or more similar to that of forewing. Ussuri district.

H. tenera Stgr., founded on a single ♀ from Raddefka, Amurland, taken in May, almost certainly belongs *tenera*. to the *Hydrelia* group, probably to *Hydrelia*. It is only a little larger than *nisaria*, very *thinly scaled* (recalling the aspect of light specimens of *Oporinia dilutata*), light grey, finely dark-dusted, weakly marked. In the distal area of the forewing 2 or 3 rows of dark dots on the veins represent the lines; a discal dot and very weak costal half of postmedian line are also present. Hindwing whitish grey; discal dot obsolescent, crossed by a very faint line; distal area with 2 others equally faint, stronger at inner margin. Both wings with conspicuous

black marginal strokes. Forewing beneath light grey with dark marginal strokes; hindwing whiter, the discal dot stronger than above, some indistinct lines beyond. According to the figure, the upper surface of the forewing shows a tendency to the darkening of the 3rd radial and 1st median veins at their origin, as in *Venusia cambrica*.

musculata. **H. musculata** *Stgr.* Rather larger than *testaceata*; ash-grey, darker mixed, the lines represented by numerous dark dots and dashes on the veins, scarcely indicated in the interspaces; marginal dashes (lunules) sharply black. Median clear space of forewing narrow, formed about as in *Venusia cambrica*; according to the figure, the anterior half of the postmedian line is also discernible, shaped about as in *cambrica*. At the inner margin of the hindwing also the lines become a little better expressed. Discal dot present on both wings. Forewing beneath yellow-grey, without trace of lines; hindwing greyish white, the dark vein-dots not connected into lines. Sutschan district, Ussuri. The figure recalls some aberrations of *cambrica*; perhaps it is really a *Discoloxia* near *conisaria* *Hmps.*

testaceata. **H. testaceata** *Don.* (= *sylvata* *Schiff.* nec *Scop.*) (10 g) is the type of the genus and one of the two species which reach the Western Palearctic Region. Rather broad-winged, dirty white or whitish grey with the principal lines of the forewing brown. Variable in the expression of the discal dots, which are sometimes almost entirely wanting. — ab. **goodwini** *Bankes* is a very dark form from Kent, densely dusted with grey, usually with the brown markings still well visible, but culminating in almost complete melanism. — ab. **intermedia** *Bankes* has the dark dusting also stronger than in the type form but not altogether obscuring the whitish ground-colour; the brown lines more strongly pronounced than in the type. It occurs together with the preceding aberration. — Larva stout, tapering at each end; head bifid, dark brown; prothorax with horny dark brown plate; purplish brown, the thorax and last five abdominal segments greenish to green; 5th abdominal with yellow lateral spot; dorsal line and some V-shaped dorsal markings white. On alder, birch, willow, etc. Pupa stout, very glossy, greenish brown, hibernating. The moth flies in June and is found in Central Europe, S. E. Siberia and Japan.

bicauliata. **H. bicauliata** *spec. nov.* (12 c). At first glance very similar to *testaceata*, forewing slightly narrower, distal margin more oblique, hindwing with distal margin subcrenulate, slightly prominent at 3rd radial, both wings with 1st median well stalked; areole rather small, 1st subcostal from its apex, 5th arising from the stalk of 2nd—4th. Ground-colour white, as in the lightest *testaceata* or on the forewing (especially in costal half) more strongly brown-dusted; postmedian line more distinct, more sinuous, the brown band-like shading which follows only reaching from costal margin to 1st median. Hindwing with little dusting, the lines rather fine and sharp. Forewing beneath suffused with smoky brown; hindwing white, with the lines nearly as above. Japan, without more exact locality, 1 ♀ from the PRYER collection, in coll. Brit. Mus.

latsaria. **H. latsaria** *Ob.* (10 g) is unknown to me, but according to the figure is certainly not the same as *phasma* *Btlr.* Rather darker brown-grey than *testaceata*, forewing slightly more elongate, the lines straight, distal area with a black-brown patch between the 3rd radial and 1st median, reaching from postmedian line to near distal margin. Ta-chien-lu.

undularia. **H. undularia** *Leech* (described as *Venusia*). Larger than *testaceata*, forewing with costal margin more arched, more elongate, distal margin more oblique, apex consequently sharper, hindwing with distal margin sinuous, appreciable incurved between the radials. Ground-colour violet-grey, forewing thickly irrorated with dark brown; lines dark brown, the proximal ones more oblique than in *testaceata*, postmedian much more dentate, with strong projecting tooth at 1st radial, the brighter brown band-like area which follows, and also the distal lines, much more strongly projecting outwards in the middle. Hindwing with similar differences. Forewing beneath more infuscated, hindwing with the lines broad. Pu-tsu-fong.

tchirinaria. **H. tchirinaria** *Ob.* (13 d) was described as an *Ephyra* but the neuration, as figured, and also the general habitus seem to show it belongs to the *Hydrelia* group; should it be found that the areole is double it would be removed to *Asthena*. Rather narrower-winged than any of the preceding *Hydrelia*, length of forewing as in a large *testaceata*, rather uniform violet-grey, forewing with a whitish spot at the distal margin of the 3rd discocellular, the dark lines feeble, outcurved, becoming nearly vertical at hindmargin, the postmedian the best expressed; fringe chequered. Underside more glossy grey, with broad curved postmedian line, accompanied proximally by a pale line. Ta-chien-lu and Mou-pin.

chionata. **H. chionata** *Led.* (= *quadripunctata* *Bienert*) (13 e). Very distinct in its shining snow-white wings with sharply black discal dots and all the markings suppressed except a strong outcurved brown grey ante-median line on forewing only and a sinuous postmedian on each wing. Forewing broad, rounded, the distal margin with minute but distinct black dots. Hindwing moderately long, with distal margin strongly convex, slightly prominent but less so than in *Asthena albulata*, of which STAUDINGER — overlooking the neuration and other characters — has suggested it may be a variety; terminal dots wholly or in part obsolete. Southern Transcaucasia and North Persia.

H. percandidata Chr. (= *candidissima* Stgr.). Very like a small *Asthenia albulata* in shape and colour, perhaps slightly narrower-winged, the distal margin of the hindwing rather more strongly prominent at the 3rd radial. Like *chionata* in having the areole undivided (rather narrow), with the 1st subcostal arising about from its apex. ♂ unknown to me, ♀ with the antennal joints slightly more projecting than in *albulata*, minutely ciliated. Forewing with 5 lines, much more slender than in *albulata*, in part obsolescent, the first 4, however, arising from enlarged brown costal spots; all are strongly sinuous, at the costa about equidistant, but posteriorly the 3rd and 4th approach one another; marginal dots small. Hindwing with 2 weak lines behind the middle. Both wings without discal dot. Underside unmarked, except at costa of forewing. Transcaucasia and N. Persia. *percandidata*.

H. flammeolaria Hufn. (= *luteata* Schiff., *centrata* F., *flavicata* Thnb.) (10 h, as *luteata*). Distal margin of hindwing sinuous, especially between the radials. Very distinct in the glossy pale yellow ground-colour and thick, undulate deep ochre-yellow transverse lines. The discal dots are dark, but not "black", as described by some old authors; that of the hindwing generally almost lost in the first postmedian line. — Larva nearly cylindrical, green, almost unmarked, at the incisions more whitish. On maple and in some districts on alder. The pupa hibernates. Imago in June or a little earlier or later. Central and Northern Europe, Russia, Armenia, Siberia and Japan. *flammeolaria*.

H. ochrearia Leech (13 e) is also yellow, but less glossy, of rather a deeper tone and dusted with light reddish fuscous; discal dots wanting and instead of the groups of thick ochre-yellow lines both wings are pretty uniformly traversed by fine, very weak reddish-fuscous lines; no dark distal streak. Moreover, the wings are much more elongate, with dark dots at the distal margin. Pu-tsu-fong, W. China; only the type known. *ochrearia*.

H. bicolorata Moore. A pretty species, showing — unlike the rest of the group — the normal Larentiid pattern. Reddish grey, the strongly undulate bands which bound the narrow median area yellow, narrowly edged with bright red proximally and distally, and bisected by a thick bright red line; a narrow yellow, red-mixed line bounds the basal area and another (broader, but somewhat interrupted) traverses the distal area. Hindwing with only the postmedian yellow and red band developed. Underside much duller, with fuscous lines, black discal dots and yellowish, undivided postmedian band. — ab. **ferruginaria** Moore, which is commoner than the name-type, has a blackish basal patch and blackish costal half of median band. — Dharmasala. Also in Sikkim the Khasi Hills, etc. *bicolorata*. *ferruginaria*.

B. Distal margin of hindwing strongly crenulate (*Agnibesa* Moore).

H. pictaria Moore. Forewing very pale yellow with burnt-coloured basal patch and irregular, incomplete postmedian band, both overlaid with some metallic scales; the small black discal dot placed in a slender, curved brown median shade which becomes still more slender and inconspicuous posteriorly; subterminal line indicated by brown (anteriorly black) spots or interrupted lines which bound it. Hindwing white; rather thinly scaled, with faint grey lines or bands. Under surface similar, the markings of the forewing more blurred. W. China: Wa-shan and Ta-chien-lu. Originally described from Sikkim. *pictaria*.

H. recurvilineata Moore. Both wings silvery white. Forewing with sinuous subbasal dark line, strongly curved antemedian line, black discal dot followed by an excurved line which is coloured orange opposite the cell, 2 sinuous postmedian lines, orange in their anterior half, the distal one here dotted with black; a subterminal line of black dots is often present. Hindwing with black discal dot and fuscous bands. Underside of forewing strongly marked with fuscous. Chang-yang and Omei-shan, small and weakly marked, perhaps a local race. Described from Sikkim. *recurvilineata*.

H. punctilinearia Leech (7 g) differs from *recurvilineata* in having the orange markings more restricted the lines more clearly defined, those of the hindwing finer, more widely separated, the two nearest the distal margin dotted with black on the veins, etc. W. China: Chow-pin-sa and Kia-ting-fu, June and July. *punctilinearia*.

H. sanguinipлага Swinh. (7 g) is very distinct in the presence of the extended orange apical patch as well as in the orange colouring of the basal patch and of the thorax, etc. The wings — as in all the species of the section — are smoothly and rather thinly scaled; the tooth at the end of the 3rd radial of the hindwing is more conspicuous than the others. Pu-tsu-fong, W. China, only one specimen known. *sanguinipлага*.

C. Forewing with distal margin elbowed at 3rd radial; hindwing more definitely angled at the same point (*Autallacta* Warr. = *Eschatarchia* Warr.).

H. lineata Warr. (= *angularia* Leech) (13 f). Large for this genus. Brown, forewing with costal margin fuscous, both wings with a fuscous line near the distal margin, that of the forewing very characteristically formed, enclosing pale marginal patches. Japan: Gifu, Nagasaki, etc. *lineata*.

67. Genus: **Euchoeca** Hbn.

Structural characters as in *Hydrelia*, hindwing with distal margin elbowed in the middle, 2nd radial vein arising well above the middle of the discocellulars. In life the wings are always erected over the back, as in the Diurni, while *Hydrelia* shows even less disposition to assume this posture than many other Larentiids.

Early stages similar to those of the preceding genera.

The only known species is exclusively Palearctic.

nebulata.

E. nebulata Scop. (= *obliterata* Hufn., *heparata* Schiff., *strigata* Thnb. nec Scop.) (10 h, as *obliterata*). Dull ochreous, the upper surface in fresh specimens (especially in the ♂) strongly overlaid with fuscous scales (except at the costal margin of forewing) which in part or altogether obliterate the markings and which at least become dense in the distal area. In flown specimens those scales soon become detached and the insect appears more ochreous, with fuscous transverse lines. Under surface with the lines always distinct. — Larva not stout, cylindrical with distinct segment-incisions; head slightly notched, green marked with black; body green with a black dorsal pattern consisting of pairs of square or oblong spots separated by a yellow dorsal line and yellow incisions. On alder and more rarely birch. Pupa very short and stumpy, tapering rapidly to anus, eyes, legs, etc. prominent, cremaster short and triangular; reddish brown with olive-green wing- and leg-cases; hibernates. Moth in June and July, distributed in Europe except the extreme North and South and the Southwest, also in Transcaucasia, S. E. Siberia and Japan.

68. Genus: **Discoloxia** Warr.

Closely related to *Venusia*, of which HAMPSON regards it as a section. The only constant difference which has yet been pointed out is that the ♂ antenna is ciliated, not pectinate.

Distribution as that of *Hydrelia*.

A. Hindwing in ♂ normal.

phasma.

D. phasma Btlr. (13 m). Superficially a good deal like *Hydrelia testaceata*, but with the discocellulars biangulate, though only quite moderately, sometimes very weakly. Distal margin slightly more oblique. Antemedian and postmedian lines grey, not brown, on the veins marked with stronger black teeth or dashes, commonly also darkened at the wing-margins; in well marked specimens the postmedian consists of a group of 4 lines, not 3 only as in *testaceata*. Japan, distributed. Other localities are at present doubtful.

conisaria.

D. conisaria Hmps. Much larger than *phasma* (size of a large *Venusia cambrica*), distal margin of hindwing sometimes slightly subcrenulate. White, irrorated with blackish, giving to the forewing and the distal part of the hindwing a grey tone, with scarcely a tinge of brown. Forewing with a curved basal line, pairs of lines, ill-defined except as dark dots or teeth on the veins, and a single dentate line, arising on costa midway between the antemedian and postmedian but strongly oblique and curved, thus approximated to the postmedian in the later part of its course; a black discal dot and black terminal strokes; the paler areas (especially that distally to the postmedian) marked with broad or narrower white streaks on the veins, which become very conspicuous in dark specimens. Hindwing proximally whitish, with discal dot; distally more like forewing but without black vein-dots and with uninterrupted white postmedian band. Forewing beneath infuscated, hindwing white with the principal lines rather strongly marked. Kashmir and S. Tibet, as well as Sikkim. A weakly marked example from Koko-Nor may be a local form of the same, though the distal margin of the forewing is rather more oblique.

tchraria.

D. tchraria Ob. (8 h) has about the size and colouring of *conisaria*, but the lines are not so conspicuously dark-marked on the veins; they are blackest from the costal margin to the subcostal vein, weakest in the middle of the wing; the postmedian pair is angulated on the 1st radial (as is also the case in *conisaria*), while in *Venusia cambrica*, with which OBERTHÜR compares it, they are here almost straight; behind the 3rd radial a second angle is formed, and here both these lines are blackened. Hindwing greyish white with 4 indistinct lines, which only become conspicuous at the inner margin. Forewing beneath smoky, hindwing white both with a single postmedian and pair of subterminal dark lines. Ta-chien-lu. — The examples from Pu-tsu-fong and Chow-pin-sa, referred here by LEECH, do not agree well with OBERTHÜR's figure and description and must be at least a separate race. I name it **accentuata** subsp. nov. Forewing with sharp black discal dot, the lines altogether stronger, not blackened only at costa but also at hindmargin and on the principal veins; thick black vein-streaks on the 1st median and especially the 3rd radial accompany the postmedian line, nearly as in *cambrica*, but larger.

accentuata.

D. blomeri *Curt.* (= *pulchraria* *Ev.*) (10 g ♀, 10 h ♂) differs from the other species which have a *blomeri*. chestnut-coloured patch near the apex of the forewing in that the median area is broadly whitish or grey-white without distinct markings; near the base there is an ill-defined reddish-brown band. Hindwing greyer, especially towards the distal margin, on the underside whiter. — Larva of moderate proportions, rugose at the sides, incisions well marked; greenish yellow, thorax with an elongate red dorsal patch, abdomen with some red lateral blotches; occasionally, however all the red markings are suppressed. On *Ulmus montana* in August—September. Pupa short and thick, tapering rapidly to the anus, which is blunt but has a sharp cremastral spike; chestnut brown with green wings; hibernates. The moth appears generally in June or July. Extremely local in Central-Europe and the Ural; also recorded from Amurland and Japan, whence I have seen no examples.

D. semistrigata *Chr.* Size of *blomeri*, the brown band less bright, narrower, placed nearer to the discal *semistrigata*. dot. S. E. Siberia and Japan; LEECH erroneously recorded a Japanese example as *blomeri* var.

D. marmoraria *Leech* (13f) differs from *blomeri* in the pencilling of zigzag black lines in the median area *marmoraria*. of the forewing, antemedian and a group of 3 postmedian strongly bent so as to meet on the fold, an oblique discal streak, some blackish distal clouding behind the 3rd radial, followed posteriorly by a double dentate line. Abdomen anteriorly with a dark dorsal blotch. A close ally, if not a variety, of the Indian *obliquisigna* *Moore*, but with darker hindwing, etc. Chang-yang, Central China.

D. laria *Ob.* (8b). Larger than *marmoraria*, median area less white, the reddish colour in distal area *laria*. not forming a subapical patch but confined to a narrow band adjoining the postmedian, from costa to 1st median; hindwing paler grey with 3 pairs of dark lines. Ta-chien-lu. Perhaps another form of *obliquisigna*.

D. megaspilata *Warr.* (7g, 11e) is characterized by the large, obliquely placed black discal mark of *megaspilata*. the forewing. Whitish, the forewing with scattered fuscous irroration, the antemedian and postmedian lines fuscous, double (the postmedian often triple), angulated near the costa, then nearly vertical but irregularly dentate, slightly convergent towards the hindmargin. Hindwing white, weakly marked, but with a few black dots at inner margin in distal half. Japan: Gifu.

D. eucosma *sp. nov.* (= *kioudjrouaria* *Leech* nec *Ob.*) (12c). Larger and whiter than *megaspilata*, the *eucosma*. discal dot not quite so large, the 3 postmedian lines rather well expressed, mostly filled in with brown shading, crossed by strong interrupted black lines on the veins; the antemedian line often single, placed quite near the discal dot, not angulated, black at costa and marked distally with fine black teeth on the veins. Hindwing white, with 2 or 3 very fine lines (sometimes obsolete, at least anteriorly) distally to the cell-dot. Forewing beneath smoky, hindwing white; the markings of the upper surface indicated. How-kow, Tibet. Type and 3 others in the British Museum collection.

D. kioudjrouaria *Ob.* (8b). I have not seen this, but cannot believe it is conspecific with the preceding, *kioudjrouaria*. in spite of much similarity. The forewing is shorter and blunter, its colour grey, the discal dot small, the antemedian line approaching the postmedian on hindmargin, whereas in *eucosma* it here turns obliquely base-wards, the postmedian less sharply angled near the costa, the band which accompanies it less sharply expressed, not marked with black on the veins. Hindwing also more greyish white. Ta-chien-lu.

B. Hindwing in ♂ with inner margin deeply folded.

D. dharmasale *Btlr.* (= *plicataria* *Leech*) (7g, as *plicataria*). Reddish brown with slight darker irroration. *dharmasale*. Forewing with the veins partly dotted with fuscous, pale between the dots; numerous very feeble, parallel, wavy darker reddish lines, the antemedian a little better expressed; only the postmedian distinct, double, the proximal one grey, the distal reddish, some lighter grey shading between them. Hindwing similar, without the lines of basal half. Underside paler, forewing with discal dot and lines beyond, hindwing unmarked. N. W. India; W. China.

69. Genus: *Asthena* *Hbn.*

Characters of *Hydrelia* but with the areole double. Palpus sometimes rather less short than in the allied genera. Distal margin of hindwing often somewhat crenulate or angled in middle.

Larva (at least in the type species) rugose and tumid, but evidently related to *Hydrelia*.

Geographical range as in *Hydrelia*.

albulata. **A. albulata** Hufn. (= *candidata* Schiff.) (13e). Shining white, the forewing with 5, the hindwing with 3 curved and in part sinuous yellow-brown lines, the 3rd and 4th of the forewing approximated. Discal dots inconspicuous, sometimes wanting; distal margin with minute black dots. — *amurensis* Stgr., from the Eastern Palearctic Region, is smaller, with distinct discal dots but wanting those of the distal margin. — Larva rather stout, the segments tumid and wrinkled, the tubercles strongly developed, the setae black; head pale green, spotted with black; body pale yellowish green, the back of the thorax and the back and sides of the abdomen strongly marked with crimson; subdorsal line and lateral stripe yellowish. On birch, hazel, hornbeam, etc. Pupa shiny, moderately slender, wing-cases swollen, the veins somewhat raised; blackish brown, at the incisions yellowish; hibernating. Moth in May—June, a very partial second brood later. Europe, Crimea, Transcaspia, etc., often very common. CHRISTOPH recorded a purer white form from N. Persia, the lines weak, chiefly expressed as dots.

anseraria. **A. anseraria** H.-Sch. (= *soldaria* Trti., *corneata* Chrét.) (13e). Besides a slight difference in shape, this species is distinguished from *albulata* by the simply ciliated ♂ antenna, the sharp black discal dots and the arrangement of the lines; the 3rd and 4th lines of the forewing are remote from one another. The cells are rather shorter. — *ab bilineata* Hirschke lacks the 1st, 4th and 5th lines of the forewing and the 2nd and 3rd of the hindwing. — *corculina* Btlr. (7h), from Japan, is perhaps not constantly separable from the name-typical form, but the lines are somewhat thicker, forming large distinct yellow-brown spots on the veins but generally more definitely interrupted between. The ground-colour itself appears somewhat less pure white, slightly tinged with yellowish. — Larva similar to that of *albulata*, bluish green, without the markings which characterize that species. On *Cornus sanguinea*. The pupa hibernates. Local in Southern Central Europe, S. E. Siberia and Japan; May and July.

nymphaeata. **A. nymphaeata** Stgr. (13e). About the size of *albulata*, the discal dots altogether wanting on both surfaces or occasionally present, though quite weak, on the underside. The yellowish lines are decidedly broader, in this resembling those of *anseraria* but more distinct: the black terminal dots are very small, in part obsolescent. The anal clasps in the ♂ are more strongly developed, the tuft which covers them composed of longer hairs. The two postmedian lines are closely approximated, as in *albulata*. From *nymphulata*, *nymphaeata* differs essentially in the thick lines as well as in the anal tuft. Ussuri and Amur region, May—July.

nymphulata. **A. nymphulata** Guen. (= *albeolata* Rbr., ? *lactularia* H.-Sch.) (13f). More delicate-winged than *albulata*, the forewing similarly shaped, the hindwing rounded, not elbowed. Glossy pure white. Forewing with 6, hindwing with 4 fine parallel pale brown lines, hardly distinct, less sinuous than in *albulata*, the postmedian not double, the proximal two of the hindwing further separated, the distal two more approximated, exactly parallel. Under surface without markings, the costal margin of the forewing somewhat infuscated. Antenna in ♂ less strongly dentate than in *albulata*, with shorter ciliation. According to HERRICH-SCHÄFFER the hindwing is somewhat more distinctly angulated than in *albulata*. Andalusia and S. France.

ochrifasciaria. **A. ochrifasciaria** Leech (13e). Generally larger than *albulata*, though small specimens also occur. Forewing rather more yellowish white, with more numerous lines; the first 4, curved, are separated from the median group by a narrow clear band; the median group consists of 3 thick lines, the first crossing the cell-dot; the space between them is mostly filled-in with yellow-brown shading, forming a sort of band, which narrows at the hindmargin; the lines and sometimes the shading become fuscous at the hindmargin. Hindwing rounded, weakly marked. Both wings with black cell-dot. Japan: Oiwake.

albidaria. **A. albidaria** Leech. Again larger than *ochrifasciaria*, silky yellowish white, the forewing with a very small black cell-dot, the lines fine, grey, exceedingly faint; a slightly curved and oblique antemedian, a double postmedian, incurved between the radialis and retracted at costal margin, and a waved subterminal, the two latter continued on the hindwing; both wings with median line. recalling that of certain *Acidalia*, commencing on costa of forewing near the postmedian but becoming oblique so as to approach the antemedian at hindmargin and continued on the hindwing rather near the base. Underside with the lines much darker grey or fuscous, thicker, the forewing as far as the postmedian more or less infuscated, its costal margin tinged with yellow. Antenna in ♂ nearly simple, minutely ciliated. W. China.

tchratraria. **A. tchratraria** Ob. (13g), described as an *Acidalia*, probably belongs here, perhaps to *Hydrelia*, in any case the hindwing neurulation shows that it is Larentiid. Very distinct in the greenish-brown costal margin and 6 nearly straight greenish brown lines, 2 only continued on the hindwing. Under surface similar, the lines of the forewing thickened with a tendency to become confluent. Ta-chien-lu.

octomacularia. **A. octomacularia** Leech (7h), of which only a single, slightly worn example (♀) is known, is perhaps related to *ochrifasciaria*. Forewing rather broader, without distinct markings excepting the very characteristic black postmedian line. Chang Yang.

A. plenaria *Leech* (7g). Rather narrower winged, with distal margin of hindwing very slightly (scarcely *plenaria*, noticeably) bent in the middle. Distinguished further by its more brownish white ground-colour and the numerous very regular waved lines. Chang Yang.

A. defectata *Chr.* (= *chrysidia* *Btlr.*) (10h). Straw yellow, easily distinguished from the rather *defectata*, similarly coloured *plurilinearia* by the rounded distal margin of hindwing, less acute apex of forewing, reduction of the dark markings, absence of subterminal pale spots, angular projection of postmedian line of forewing at 1st radial, etc. Antenna in ♂ almost simple, minutely ciliated. Ussuri district, Korea and Japan.

A. straminearia *Leech* is very near *defectata* (10h), the palpus rather less strong, the ground-colour rather *straminearia*, paler yellow, all the markings weaker, the antemedian line forming a regular curve, while in *defectata* it is angulated before the middle, no trace of the longitudinal dark cloud in the middle of the distal area which is discernible (often strong) in *defectata*. Founded on a single worn ♂ from Wa-shan, W. China. Perhaps merely a form of the preceding, which seems generally more weakly marked on the continent than in Japan.

A. distinctaria *Leech* (7g) differs from *defectata* in having the wings white, with only a tinge of *distinctaria*, yellowish, the costal margin of the forewing broadly ochreous; the median line is more strongly angled at the 1st radial. Palpus short. W. China: Wa-shan and Pu-tsu-fong.

A. plurilinearia *Moore* (= *unistirpis* *Btlr.*) (10i). ♂ antenna minutely ciliated, not dentate. Hindwing *plurilinearia*, subcrenulate, between the radials weakly emarginate. The markings, as shown in our figure, are unmistakable. — ab. **denigrata** *Warr.* lacks all the black shading of the distal area. Distributed from N. India to Amur-*denigrata*, land and Japan.

A. conditaria *Leech* (7g) differs from *plurilinearia* in its darker, less yellowish forewing, with more *conditaria*, pronounced dark median band, and in the paler, often almost white hindwing, which is rarely so strongly marked as in the specimen we have figured and which is unfortunately a little exaggerated in printing. Distal area of forewing without black shading except an oblique apical streak. Ta-chien-lu, W. China, apparently not rare in May—June.

A. electaria *Leech* (7g) is a beautiful and unmistakable species, though agreeing with the two preceding *electaria*, in shape and structure. The under surface is similarly marked, but duller, the faint median lines of both wings wanting, but the hindwing with a sharply marked, fine postmedian line. The unique example (a ♀) is from Mou-pin.

70. Genus: **Cambogia** *Guen.*

Related to *Hydrelia*, the areole small or altogether wanting, the 5 subcostals long-stalked. ♂ antenna usually with very long pectinations, in some subgenera ciliated. Hindwing with distal margin variable, almost regularly rounded to dentate or strongly angled, 1st median usually stalked.

An extensive genus, most prevalent in South America, but also well represented in the Indo-Australian Region and with a few stragglers in the Palearctic.

A. Antenna in ♂ with fascicles of long cilia; distal margin of hindwing dentate (*Acolutha* *Warr.*).

C. pictaria *Moore* (13m). White. Forewing suffused with grey and reddish in anterior half and with *pictaria*, yellow in posterior, traversed by 5 thick, waved, interrupted reddish lines. Variable, sometimes more strongly yellow. Distributed in India. Palearctic specimens, except one from Gensan, Korea, July, are unknown to me.

C. pulchella *Hmps.* (13m) has the costal area of the forewing much brighter red, more uniform; a strong, *pulchella*, dark, double submarginal line, often thickened into a blackish spot close to hindmargin; hindwing mostly purplish grey, traversed by thick, irregular darker and pale lines. Hindwing beneath white, with large, well-defined fuscous blotch, narrow at costal margin but rapidly broadening so that at the inner margin it reaches from before the middle almost to the anal angle. Widely distributed in the mountains of India, one specimen recorded by LEECH as probably from Yokohama (ex coll. PRYER).

B. Antenna in ♂ bipectinate. Hindwing not dentate (*Cambogia*).

C. phoenicosoma *Swinh.* An aberrant species in that the 1st median vein of the hindwing arises well *phoenicosoma*, separate; forewing without areole. Pale yellowish grey, forewing with V-shaped reddish basal patch (its apex

somewhat blunted), both wings with small black discal dot and extremely broad reddish median band (on the hindwing much paler in Japanese specimens), its distal edge on the forewing arising at two-thirds of costa but running obliquely outwards (with one projection midway) so as to touch the distal margin at the 3rd radial, then again nearly at the 1st median, finally running in a curve to hindmargin near the angle. Underside much more weakly marked. Oiwake, Japan. Described from Assam.

*conspicua-
ria.*

C. conspicuaria *Leech* (12b) has the distal area more yellowish and quite differently shaped, both wings with characteristic angular discal marks, that of the forewing yellow, that of the hindwing black. Omei-shan, W. China, in July; only the type (♀) is known.

71. Genus: **Physetobasis** *Hmps.*

Structure similar to that of *Asthena*, but the shape very different, more like that of the succeeding genera. Forewing long and narrow, distal margin strongly oblique. Hindwing also rather narrow, but not long, distal margin somewhat crenulate. In the ♂ the retinaculum is usually developed into a large spatulate plate and the type species (*annulata* *Hmps.*) shows further secondary sexual modifications. Discocellulars of hindwing strongly oblique, variable, sometimes distinctly angulated at the origin of the 2nd radial.

A small Indian genus.

dentifascia.

P. dentifascia *Hmps.* (= *mandarinaria* *Leech*) (11i, as *mandarinaria*). Forewing brown, the lines black, white edged, thickened at costal margin; their very characteristic form is well shown in our figure; sometimes there is also a weak dark central shade. Hindwing with distal margin scarcely crenulate, discocellulars angulated; paler, at least anteriorly; distal area nearly as that of forewing. Dharmasala and W. China. A weakly marked ♀ from Kiukiang perhaps indicates a local race.

72. Genus: **Pomasia** *Guen.*

General characters as in *Eupithecia* but the abdomen not crested, the coloration in general more gay, the hindwing less regularly rounded (typically somewhat bent at 3rd radial), with 2nd discocellular somewhat curved inwards, thus with a very slight angle at the origin of the 2nd radial, which is central. Palpus with both the 2nd and the 3rd joint long, rather strong, but shortly scaled.

An almost exclusively Indo-Australian genus, of which one species has recently been discovered in Japan.

*denti-
clathrata.*

P. denticlathrata *Warr.* (13m). Pale ochreous yellow, traversed by very numerous (on forewing about 15, on hindwing about 9) undulate liver-coloured lines, which are mostly thicker than the interspaces of the ground-colour and are in places connected; the yellow colour is slightly darkened in the distal area. Fringes dark-spotted, the spots opposite the 3rd radial and 2nd median somewhat enlarged. Underside more orange-coloured, very weakly marked except at costal edge of forewing, which is fuscous and yellow spotted. Described from the Naga Hills, afterwards taken in the Khasia and more recently by WILEMAN on Kiushiu: Kagoshima in July, Kiyotaki in September.

73. Genus: **Eupithecia** *Curt.*

Small or (rarely) middle-sized moth, never large. Face with cone of scales or merely roughened. Palpus moderate to long. Antenna of ♂ simply ciliated. Hindtibia with all spurs. Abdomen with minute dorsal crests. Forewing rather elongate, with areole generally single. Hindwing relatively short, discocellulars not biangulate, not very oblique, 2nd radial arising in the centre. ♂ with 8th abdominal segment widened into a tube which encloses the copulatory organs, the sternite and tergite of this segment with characteristic chitinized plates.

Egg more or less oval, the sculpturing variable but commonly consisting of a network of irregularly shaped cells; duration of this stage generally short. Larva variable in form, very commonly with a lozenge-shaped dorsal pattern and feeding on flowers. Pupa usually hibernating in an earthen cocoon.

A very extensive genus, distributed almost throughout the world and generally very easy to recognize by its shape and aspect, even apart from the structure. The species with the areole double are regarded by MEYRICK as belonging to a separate genus *Eucymatoge* *Hbn.*, but they do not form a natural assemblage and I have not even separated them off as a subgenus, but have followed the arrangement of DIETZE, the world-

renowned specialist in this group, whose work must be consulted for fuller information than the exigencies of space allow us to give here, especially as regards the biology. Mention should also be made of two excellent monographs dealing with the genus, DRAUDT's on the egg (Iris vol. 18, p. 280-320) and PETERSEN's on the genitalia (Iris vol. 20, p. 203-314).

E. tenuiata Hbn. (= *macellata* Fisch.-Rössl., *inturbaria* Frr., ? *singularia* Nolck.) (12k). Forewing with apex rather more rounded than in most *Eupithecia*. Brown-grey, in fresh specimens with a slight greenish tinge; costal area of forewing strongly marked, with large approximated spots; discal dot strong, the space between it and the postmedian usually rather pale. — ab. *niveipicta* Bastelb. has the ground-colour white instead of grey. — *cinerae* Gregs., from Scotland, is said to be larger, clearer ash-grey and with the lines weaker, but its constancy is questionable. — The egg is laid in cracks in bark of sallow and hibernates. The larva feeds up very rapidly in the catkins. Imago from the end of May to July, common among the food-plant. Distributed in Central and Northern Europe, reported also from Transcaucasia.

E. inturbata Hbn. (= ? *neglectata* H.-Sch., *subciliata* Dbl.) (12k). Similar to *tenuiata* but with less rounded apex, strong yellow brown tinge in the ground-colour, smaller discal dot, more strongly marked hindwing, but especially by the long ciliation of the ♂ antenna. The egg hibernates; DIETZE says "probably", but I have myself bred it. The larva feeds on the flowers of maple. Imago in July, local in Central Europe.

E. nigritaria Stgr. is said to resemble *palustraria* (13f) in size and colour but with the structure of *inturbata*. Black with fine, extremely indistinct, dull whitish lines, costal margin of forewing and base of hindwing tinged with whitish, the former with a sharp white dot before the distal margin. Discal dots and interrupted marginal line deeper black. Taurus.

E. haworthiata Dbl. (= *isogrammaria* H.-Sch. nec Tr.) (12k) is another small species with rather rounded apex, most certainly recognizable by the conspicuous orange patch on the anterior part of the abdomen dorsally. Wings darker grey than in *tenuiata*, the discal dot wanting or quite indistinct. Larva in the flower-buds of *Clematis vitalba*, easily detected by the round hole which it makes. The pupa hibernates and often 2 or even 3 winters are passed in this state. The moth flies in June and July. Central and South Europe, Asia Minor, the Caucasus, China and Amurland.

E. homogrammata Dietze. Similar to *haworthiata*, mostly still smaller. Distinguished by the absence of the orange dorsal patch; median band of hindwing beneath generally narrower and less angulated, sometimes obsolescent. Amur and Ussuri in July.

E. subtacincta Hmps. Darker than *haworthiata*, discal dots present, under surface much more sharply marked, the paler bands being almost white; abdomen without distinct orange dorsal patch. Dharmasala.

E. immundata Z. (= *argillacea* H.-Sch.) (12k) is a rather broad-winged, very weakly marked species of a glossy, somewhat argillaceous grey colour; larger than the preceding group; discal dot wanting or scarcely indicated; no pale subterminal line. — Larva in the berries of *Actaea spicata*. The winter — sometimes also a second — passed in the pupa. — *reikjavikaria* Stgr., an almost unicolorous dark form from Iceland, is referred here but nothing, I think, is as yet known regarding its biology.

E. plumbeolata Haw. (12k). Differs from *haworthiata* in its somewhat larger size, slightly straighter costal margin, lighter colour and absence of the orange patch on abdomen. Rather better marked than *immundata*, greyer, somewhat less glossy, besides being somewhat smaller, with less rounded costa. Larva in flowers of *Melampyrum*. The pupa hibernates, often twice. Moth in June, distributed in Europe as far as to the Ural and in Asia Minor and said to occur again in Amurland.

E. lutosaria Bohatsch recalls *plumbeolata* (12k) but is yellowish brown instead of grey, the lines white, much more distinct, especially the double outer line of both wings; veins not chequered. Possibly a form of *spissilineata* (13f). Achalzik, Caucasus.

E. cucullaria Rbl. (= *undata* Bohatsch, nec Frr.). Ground-colour paler than in *plumbeolata*, the scaling thicker and coarser, thus not glossy, forewing somewhat more pointed, lines more dentate, fringes sharply chequered, underside much more distinctly marked than in *plumbeolata*. The unchequered veins distinguish it from the following. S. E. Europe and Konia, Asia Minor.

E. spissilineata Metzner (= *multilineata* Mann) (13f). Somewhat variable in size and depth of colour, but easily known by the minute darker irroration in the ground-colour and especially by having the numerous rather broad white lines almost entirely broken up into large vein-dots. Turkey, Greece, Asia Minor, etc.

- pini*. **E. pini** Retz. (= *abietaria* Goeze nec Schiff., *strobilata* Bkh., *togata* Hbn.) (13k). A large and handsome species, lines sharply expressed and marked with black teeth or dashes on the veins, a very large discal dot and two red-brown bands. Face without well-developed cone of scales, palpus about twice as long as diameter of eye; forewing with areole double. — ab. **constricta** ab. nov. Median area reduced to a width of only 1–2 mm, the antemedian and postmedian lines connected by black veins. Britain, 1 ♂, rather dark, in coll. Brit. Mus. — **debrunneata** Stgr., from the Ussuri district, is more mixed with blackish, the red-brown tone wanting. — The larva feeds in the green cones of *Picea excelsa* or of *Pinus cembra*. The pupa hibernates, often for two winters. The moth flies in June and early July. The name-typical form inhabits Central and Northern Europe. Very similar or identical examples also in Canada. — **gigantea** Stgr., from the Ussuri district and Japan, is darker grey than in *debrunneata*, the reddish bands (as in *rufescens*) strongly developed.
- bilunulata*. **E. bilunulata** Zett. (= *strobilata* Hbn. nec Bkh.) (12e). Extremely like a small *pini*, but the face has a strongly-developed projecting cone, the palpus measures about 3 times the diameter of the eye and the areole is undivided. The larva feeds in the galls of *Chermes* on *Picea excelsa*, only very exceptionally in the cones. Imago in May–June. Range similar to that of *pini* but unknown in Britain and Eastern Asia.
- rufescens*. **E. rufescens** Btlr. Near *bilunulata*, agreeing in structure. Perhaps slightly larger, but narrower-winged. Both wings darkened with fuscous dusting, arranged in close lines, discal dot of forewing small, of hindwing obsolete; reddish bands rather broad, pale subterminal markings obsolescent. Japan.
- linariata*. **E. linariata** E. (12d). Forewing with dark blue-grey or blackish median band, finely white-edged, a bright brown band between this and the basal patch, a second (mixed with blackish between the radials and near the hindmargin) proximally to the subterminal line; basal patch blackish at costal margin only. Larva on seeds of *Linaria*. The pupa usually hibernates but occasionally the moth emerges the some summer. Usual flight-time June. Widely distributed in Europe; also in Asia Minor and Transcaucasia.
- pulchellata*. **E. pulchellata** Steph. (12d) is on an average larger, the median band more watered with fine white lines or rows of dots, the blackish markings in the distal area almost wanting or at least reduced. The name-typical form is only known to me from the British Isles, but is said to occur very similarly in Portugal, Spain, France, Belgium, Holland and N. W. Germany. Numerous local races and aberrations have been named. — ab. **iberica** Dietze is a very pale aberration from Castile. — **hebudium** Sheldon is a constant form in the Hebrides with the median band and hindwing somewhat darker, the brown bands much darker and less yellowish, the basal patch more completely dark-filled. — **pyreneata** Mab. is smaller, generally with narrower median band, on an average less spotted with white, the brown inner band and the pale band which follows the median commonly somewhat widened. Variable, sometimes with rather blurred markings. Distributed across Central Europe from the Pyrenees to the Ural. — ab. **reducta** Bastelb., has the median band mostly light, the dark colour being almost confined to a small spot round the cell-dot. — **digitaliaria** Dietze (= *intermedia* Dietze) (12d) indicates the transitions between *pulchellata* and *pyreneata*. — Larva on *Digitalis*, generally spun up in the flowers, sometimes also in the seed-vessels. The moth flies in June and July.
- laquaearia*. **E. laquaearia** H.-Sch. (= *merinata* Guen.) (13f). Distinct from *linariata* in having the ground-colour more uniform grey, somewhat mixed with brown but without the bright bands of *linariata*; median area grey-lined, not definitely banded, with the black cell-dot very conspicuous. Very variable. — **istriaca** Dietze is a smaller form, rather more robust and more uniformly marked. Found chiefly in the Mediterranean region and in the summer generation. — ab. **perfidata** Mann, from Corsica, lacks the reddish brown distal band. — Larva on flowers and seeds of *Euphrasia stricta* and *alba* and *Odontites lutea*, the summer brood on *Hypericum*. The pupa hibernates or the moth appears in about 14 days. Widely distributed in Central and Southern Europe, perhaps occurring also in N. Africa.
- limbata*. **E. limbata** Stgr. is said to be very like *laquaearia* (13f) but entirely without the brown basal band; the light grey or whitish ground-colour sometimes shows a greenish tinge. N. E. Asia Minor and Transcaucasia.
- liguriata*. **E. liguriata** Mill. (= *roederaria* Stndf.) (12d). Rather broad-winged, pale cinereous, slightly tinged with brownish, especially in distal area; forewing with rather large, conspicuous, oblong, black discal dot, median band very feebly indicated in greyish, on the costal margin strongly marked with four blackish spots. Palpus rather short. Larva on flowers of *Sedum dasyphyllum*. Moth at end of May and beginning of June, sitting on rocks and walls. Mountains of Andalusia, Pyrenees and Basses-Alpes; also, unless MILLIÈRE really referred to the following species, from Liguria.
- pantellaria*. **E. pantellaria** Mill. Structure and general markings of the preceding but rather less broad-winged, more variegated and apparently much more variable. The name-typical form from the volcanic island of

Pantellaria was rather sharply black-marked on a clear white ground and does not seem to have been taken elsewhere. — **illuminata** *Joan.* is bright brown in the basal and distal areas, well mixed with black and white chequering. Constantine, N. Africa; more or less similar forms occur also in Sicily, Spain, Portugal and Teneriffe. — Larva on *Cotyledon umbilicus*. The pupa hibernates, often twice. Moth in the latter half of May. — **deverrata** (*Chrét.*) *Dietze* from Gafsa, Tunis, may probably be a distinct species. Slightly more robust, yellowish clay-colour, the transverse markings variable, the fringes not chequered, the underside almost markingsless. *CHRÉTIEN* found the larva in December on *Deverra scoparia*; the pupa lay over till October. — **brunneata** *Stgr.*, from Mesopotamia, is probably also a separate species, more delicately built, clay-yellowish, the discal dot small, the markings variable. *illuminata.*
deverrata.
brunneata.

E. albidulata *Stgr.* reminds of *oblongata* (12d) or *breviculata* (12m) in its white ground-colour, while its narrow brownish subbasal band and very indistinct brownish distal band seem to place it rather in the neighbourhood of *laquaearia* (13f). White, the forewing with large black cell-dot, the markings brown, basal line indistinct, the median area chiefly indicated by two dark costal spots, proximally and distally to the cell-dot; distal brownish band broad, traversed by distinct, dentate white line. Hindwing with small discal dot and postmedian row of small dark dashes on the veins, distal band similar to that of forewing. — Only known from the Caucasus. *albidulata*

E. irritaria *Stgr.* is described as closely similar to *irriguata* (13e) but distinguished by the underside, on which the cell-mark is very indistinct, the only conspicuous marking being the broad dark distal band, traversed by white subterminal line. Even on the upperside this band is better developed than in *irriguata*. Turkish Armenia and Transcaucasia. *irritaria.*

E. irriguata *Hbn.* (= *variegata* *Haw.*) (13e). Wings long and narrow, white, forewing with rather large black discal dot, blackish subbasal band, thick costal beginnings of the otherwise indistinct lines, and dark distal area traversed by an irregular subterminal line. — **eriguata** *Rbr.* Ground-colour less pure white, markings less sharp. Figured from Andalusia, according to *DIETZE* the prevailing form on the Middle Rhine. — **mauretanica** *Dietze* is a much blackened race from Algeria, the median area in particular darker. Transitions occur in Tunis and Portugal. — Larva very slender, yellow with blood-red dorsal spots. On the leaves of different species of oak. Pupa strikingly slender; hibernates. Imago in April, sitting on tree-trunks. Local in Central and Southern Europe. *irriguata.*
eriguata.
mauretanica.

E. costimacularia *Leech* (13k) somewhat recalls *irriguata* in the markings of the forewing but the resemblance is most probably superficial only. Palpus very long, as in *bilunulata*. Rather larger than *irriguata*, wings rather less elongate, tinged with very pale brown; forewing with basal patch indicated by a very short line from the costa, median area as in weakly-marked *irriguata*, the dark markings more brown, subterminal line interrupted, strongest from 2nd median to hindmargin, here rather thick and accompanied proximally by some red-brown shading, which also appears as a costal dot but is otherwise very weak. Hindwing whiter, with small discal dot and strong, thick commencements of brown lines at inner margin. Japan (? Yokohama), only the type ♀ known. *costimacularia.*

E. despectaria *Led.* Wings elongate, clay yellowish, without gloss, the lines very fine, black-brown, median space broad; antemedian line curved, postmedian bent outwards near costa, thence finely dentate; costal margin darkened at the origin of the lines; discal mark elongate, conspicuous, followed by some dark scales which give the appearance of a light-centred discal spot. Hindwing paler, with blue-grey antemedian and postmedian bands, which become obsolete anteriorly. ♂ antennal ciliation short. Altai and Ili district. *despectaria.*

E. staudingeri *Bohatsch* is larger and more robust than *despectaria*, otherwise similarly formed and coloured, but rather darker. It differs in the absence of transverse markings, which are only hinted at on the costa, and by the chequered median vein; discal dots very distinct, not quite so long as in *despectaria*. Beyrout. *staudingeri.*

E. exiguata *Hbn.* (= *lanceolaria* *Wood*) (12m). Forewing rather long and pointed, yellowish grey, with rather large, somewhat oval black discal dot; the most characteristic markings are the strong black dashes on the radial and median veins where they cross the postmedian band. Larva similar to that of *irriguata*, darker green, the red dorsal spots somewhat lozenge-shaped. On the leaves of hawthorn, blackthorn, ash, barberry, *Rhamnus* and numerous other trees, full-fed in September or even into October. In June the moth may be found resting on tree-trunks and palings or taken at night at light. Central and Northern Europe, S. W. France and Piedmont. *exiguata.*

E. exactata *Stgr.* Light grey or yellow grey, recalling *exiguata* in the abdomen and the distal area, but entirely without black vein-dashes proximally to the postmedian line; Zaisan. — **modesta** *Dietze* is a duller greyish form, in some respects recalling *nephelata*. Aksu. *exactata.*
modesta.

- mesogram-mata.* **E. mesogrammata** Dietze. "Forewing broad, yellowish grey varied with red-brown, median area bluish grey, not constricted as in *exactata*, to which it is perhaps related". Schahkuh, Persia.
- insignata.* **E. insignata** Hbn. (= *consignata* Bkh.) (12e). Forewing elongate and pointed; very characteristically marked. Pale whitish grey, the veins finely darkened; the large brown subbasal costal spot or half-band is occasionally continued across the wing; the blackish spot along the middle of costa is confluent with the elongate black discal mark; a further dark brown spot between this and the apex. Larva chiefly on apple but also on stone-fruit, sloe and whitethorn, in May—June, eating the leaves and blossoms. Imago in April and early May, on tree-trunks. Distributed in Central Europe, also recorded from Asia Minor and Kashgar.
- valerianata.* **E. valerianata** Hbn. (= *viminata* Dbl.) (12k) is glossy grey, the dark lines very weakly indicated, only at costal margin stronger, discal dots minute or wanting; subterminal line indicated, generally ending in a distinct spot near hinder angle, which helps to distinguish *valerianata* from *plumbeolata*. Larva on the flowers and seeds of *Valeriana officinalis*. Hibernates as pupa. The moth flies in May and June and is distributed in Central Europe, Livonia, Finland, etc.
- illaborata.* **E. illaborata** Dietze suggests a dwarfed, pale *valerianata* but with more elongate wings, affinities uncertain. Light grey with a tinge of clay-colour, median area darkest distally and distal area proximally. Variable, discal dots mostly wanting. Aksu, Chines and Korla.
- palustraria.* **E. palustraria** Dbld. (= *pygmaeata* Hbn. nec Bkh.) (13f). A very small, rather broad-winged species, glossy, dark smoky brown, generally very weakly marked, though a white subterminal dot near the hindmargin of the forewing is present, often very conspicuous, not rarely repeated in the hindwing. — ab. **pseudozibellinata** Dietze is more copiously sprinkled with light scales. Larva on *Cerastium triviale* and *aquatica*. The pupa hibernates, commonly over two winters. The moth is found chiefly in marshy places and flies in the afternoon. Inhabits Central and Northern Europe, also recorded from Spain (Cuenca) and Amurland (Askold).
- caliginea.* **E. caliginea** Btlr. (= *zibellinata* Chr.) has been treated as a variety of the preceding but is — as DIETZE points out — a good species with longer, more pointed palpus, the ground-colour almost black, beneath with the whitish lines more strongly marked. Moreover the wings are rather more elongate and the ♂ antennal ciliation as long as the diameter of the shaft (in *palustraria* much shorter). Japan and the Amur-Ussuri district.
- undata.* **E. undata** Frr. (= *scriptaria* H.-Sch.) (12k). Dark ash-grey with numerous waved paler transverse lines, the most distinct of them grouped in 3 or 4 pairs. Discal dot rather small, longer than wide, often wanting; subterminal line fine, dentate, fringes chequered. Variable in colour. The larva feeds on the seed-pods of *Silene rupestris*. The pupa hibernates, sometimes twice. Best known from the Alps but also recorded from Central Italy and N. Norway, the Sajon district in Siberia and singly from Asia Minor and Transcaucasia.
- puengeleri.* It is found in July, resting on rocks in mountain districts. — **puengeleri** Dietze is very likely a separate species, though the ♂ genitalia seem to associate it with *undata*. Superficially very different, more suggesting a relationship with *graphata*. Rather smaller and rounder-winged than *riparia*, whitish grey with a strong bluish tone, traversed by about 13 very regularly arranged darker blue-grey waved lines, a light, weakly dentate band distally to the median area. Under surface almost uniform pale slaty grey, quite weakly marked; distal margin scarcely darkened, not sharply light intersected, fringes not distinctly chequered. Gudaurl, Caucasus, at the end of June.
- leptogram-mata.* **E. leptogrammata** Stgr. Similar to *graphata* and *undata*, not so sharply strigulated as in the former, hindwing not so white. A characteristic, though not very conspicuous brown-grey suffusion before and behind the 1st median vein of the forewing, also on the vein-ends; the dentate subterminal line, usually so prominent in the allies, is wanting. Underside shining white-grey, distal margin light grey, in the allies mostly blacker. Zaisan and Issyk-kul.
- concremata.* **E. concremata** Dietze is darker ash-grey, less marked, hindwing whitish with strikingly wide, black, interrupted marginal line. Sinin, Central Asia.
- inconspicua.* **E. inconspicua** Bohatsch. Similar to *undata*, more slenderly built, lighter coloured, the wings more elongate. Yellowish grey with dirty white bands, generally indistinct, rather more obliquely placed than in *scriptaria*. Discal dots very small but (as also the dark terminal streaks) more distinct than in *scriptaria*. Not rare in Asia Minor and Southern Armenia.
- variostrigata.* **E. variostrigata** Alph. (13f). Forewing whitish with numerous oblique, not waved blackish lines and here and there in the middle an admixture of brownish which gives to the wing a chequered appearance; discal spot indistinct; subterminal line distinct throughout; fringes weakly chequered. Palpus about twice as

long as the diameter of the eye. Antennal ciliation in the ♂ longer than the diameter of the shaft. The name-typical form is distributed from S. Russia and Asia Minor to Transcaspiæ. — **designata** Dietze. More earth-coloured, thus less sharply black-and-white-marked. Somewhat resembles *cooptata*, but differs in the longer antennal ciliation. Caucasus. — **constantina** B.-Baker (? = *albosparsata* Joan.). About midway between typical *variostrigata* and *artemiseata*; more brownish than the former, more strongly marked with black and white than the latter, at least from the discal dot obliquely to the hindmargin. Algeria. JOANNIS's type of *albosparsata* was from Palestine. — **artemisiata** Const. is a small, strongly brownish form with the black and white markings mostly broken up into dots and streaks. S. France. — The larva of the form *artemisiata* has been found in the late autumn feeding on flowers and seeds of *Artemisia maritima* f. *gallica* (occasionally on *Camphorosoma* and even *Solidago*). Imago in September.

E. santolinata Mab. (13f). Similar to *millefoliata* (12h) but with all the markings much sharper, especially the boundaries of the median area. Discal dot of forewing large, oblique angled markings running from this to the hindmargin, much as in *sobrinata*; median vein at its end and the base of the branches which spring from it blackened. Larva in late autumn on *Santolina chamaecyparissus*. Moth in May-June. Only known from S. France (between Carcassonne and Narbonne) and Spain (Cuenca).

E. bastelbergeri Dietze. A small species, characterized by the elongate terminal segment of the abdomen. Violet-grey, the posterior part of the forewing more or less strongly mixed with ferruginous brown. Discal dot small, black, light-edged. Forewing with 3 oblique light lines, angled near the costa, otherwise nearly straight; 1 or 2 much finer lines proximally to the postmedian; thorax, base of wing and subcostal vein mixed with white scales, perhaps indicating a relationship with *bohatschi* and *rubellata*; subterminal line sharply dentate. Hindwing rather dark grey with dentate lines. Underside much less sharply marked, without the characteristic light lines. The ♂ antenna appears weakly dentate. Syr-daria, Turkestan.

E. silenata Assmann (12h). Light brown-grey, so strongly dusted with blackish fuscous as almost to obscure the ground-colour except in the bands which bound the median area, some interrupted lines or spots in the basal and median areas, however, remaining pale; cell-dot large, black, appearing somewhat raised; subterminal line distinct. Hindwing not quite so dark. Palpus long, about $2\frac{1}{2}$ times the diameter of the eye. — **pseudolariciata** Stgr., from the Austrian Alps, has the dark dusting reduced, the principal lines more conspicuous. — Larva in the spun-up calyces of *Silene inflata*. The pupa hibernates. The moth appears in June. Local in the Alps, Silesia and Galicia.

E. carpophagata Rbr. Light grey, somewhat bluish tinged and with scattered blackish scales. Forewing with 4 strong dark costal spots; median area marked by not very conspicuous parallel waved antemedian and postmedian dark lines; cell-dot weak, almost lost in a median line. Under surface whitish, weakly marked. Antennal ciliation nearly as long as diameter of shaft. Larva on the flowers and seeds of *Silene saxifraga*. The pupa hibernates. *carpophagata* flies in late June and July and rests on rocks. The name-typical form is only known from Andalusia and Central Italy. — **cassandrata** Mill. (13f), from the S. French Alps, is larger, the ground-colour more reddish, the bands which limit the median area lighter, all the dark markings broader and more distinct, especially the postmedian line (band) of the hindwing. — **teriolensis** Dietze, from the Dolomite region of the S. Tyrol and Carniola, is likewise suffused with reddish but appears rounder-winged, less coarsely marked, the hindwing without very distinct dark band.

E. venosata F. (= *insignata* Hbn.) (12e). Variable in size and colour but nearly always easily recognizable by the network of fine, sharply black markings. In the name-type, which is also by far the commonest form, the ground-colour is pale delicate grey, sometimes with a tinge of dove-colour or of reddish. — **fumosae** Gregson (= *nubilata* Bohatsch, *grisea* Dietze) is a dark smoke-coloured race from the Shetland Islands. — In ab. **bandanae** (!) Gregson the white bands remain conspicuous on the smoky ground. Among **fumosae**. — **ochraceae** Gregson (= *orcadensis* Prout) also has the ground-colour darkened, but ochreous or clay-yellowish, not smoky; markings normal or sometimes weakened as in *fumosae*. Orkney Islands. — The larva lives spun up in the flowers of *Silene*, especially *Silene inflata*. The pupa hibernates, often passing two winters in this stage. *venosata* flies in June and is widely distributed in Europe, Transbaikal, etc.

E. schiefereri Bohatsch (= *caeruleata* Favre) (12m). Extremely near to *venosata* but separable by the genitalia, the ♂ antenna also, according to DIETZE, showing slightly longer ciliation. Ground-colour on an average a shade darker, slightly more tinged with violet; perhaps on an average the median line of the forewing in *schiefereri* is somewhat less sharply expressed and more often passes distally to the cell-mark (in *venosata* proximally, or crossing it) and the hindwing of *schiefereri* may be on an average somewhat more strongly marked. — Larva on *Silene nemoralis* and *Saponaria ocimoides*. The moth appears in May or early June, thus on an average earlier than *venosata*. Local, Southern and S. Central Europe to Asia Minor.

- demetata*. **E. demetata** Chr. (= ? draudti Dietze) (13f). This and the following are little-known and doubtful forms. *demetata* is more brownish than typical *venosata*, approaching the form *ochracea* in colour; the 4 principal lines, according to the figure, are placed nearly as in *venosata*, but with the antemedian straighter and rather nearer to the subbasal, the postmedian also less irregular in its course; the accompanying fine line is very weak and the white bands scarcely indicated; veins not blackened Kopet-dagh, near Askhabad.
- stigmaticata*. **E. stigmaticata** Chr. (13f) which was discovered together with *demetata*, is very similar but of lighter reddish-yellow colour, with the median line wanting, except as a costal mark, and with a very strong, linear cell-mark. Transcaspia and Ili district.
- hilariata*. **E. hilariata** Dietze differs appreciably from *venosata* in the genitalia and in the antenna of the ♂, which has longer ciliation — exceeding somewhat the diameter of the shaft. Paler than *schiefereri*, with a more earth-coloured tone, the approximation or fusion of the black lines in the median area, which only occurs as an aberration in *schiefereri*, is here normal; fringes chequered; discal spot black, very large. Underside light, with scattered dark scales, the markings of the upper surface indicated. Juldus Mountains, Ili district.
- silenicolata*. **E. silenicolata** Mab. (12m) is best distinguished from the 3 preceding by its longer, sharper palpus, which is more than twice as long as the diameter of the eye; antennal ciliation in the ♂ about as long as the diameter of the shaft. Ground-colour uniform smoky grey with violet reflections, the markings similar to those of *venosata* but the spaces between the parallel lines not lighter, the median line accompanied distally by one or two finer parallel lines, while in *venosata* it is simple. Larva on *Silene nemoralis*; in Corsica on *S. paradoxa*. Flight-time May. Vallais, Central Italy, Styria and Corsica, probably also Bosnia and Bulgaria.
- gelinaria*. **E. gelinaria** D. Luc. is perhaps a form of the following. It seems scarcely to differ except in having the anterior (distally directed) curve of the postmedian deeper and a slight angle in the same line on the 2nd median, thus somewhat approaching *silenicolata*. Nefta, S. Tunis.
- carpophilata*. **E. carpophilata** Stgr. (13f) differs from *silenicolata* especially in the form of the postmedian line, which is curved somewhat in an S-shape, not dentate, and entirely lacks the sharp angle inwards on the 2nd median vein as well as the black streaks on the veins. In STAUDINGER's latest Catalogue it is suggested that it may be a variety of the following species. Aragon and the Ussuri district.
- alliaria*. **E. alliaria** Stgr. (12e). Brownish grey with extremely fine black lines of varying distinctness, commonly with the subbasal, antemedian (twice dentate outwards) and postmedian (strongly curved in anterior part, without deep indentation posteriorly) distinct, the rest faint; cell-dot distinct; pale subterminal line present, thickened near anal angle. — **notata** Dietze has the discal dot larger and blacker, the antemedian and postmedian lines very strong; ground-colour perhaps less greyish brown. Spain and S. France. — Larva on *Allium*, end of August to beginning of October, spun up among the flower-heads. The moth flies at the end of June and in July. The name-typical form inhabits Lower Austria, Hungary and Asia Minor.
- terrenata*. **E. terrenata** Dietze is said to be related to the *venosata* and *alliaria* groups, but the genitalia are comparable with those of *virgaureata*. Rather long-winged, uniform earth-grey, discal spot of forewing large, black, antemedian and median lines double, the latter touching the cell-spot; several postmedian lines, the proximal one strongest. Has been confused with *tribunaria*, but differs in colour, etc. Variable. Near Askhabad.
- ponderata*. **E. ponderata** Dietze. Smaller than *terrenata*, less elongate, cell-spot much smaller, the double median line not sharp, a distinct subterminal present, fringes distinctly chequered, palpus somewhat stronger. Narrower and less brown than *alliaria*; stronger whitish abdominal crests distinguish it from both. Ordubad.
- tribunaria*. **E. tribunaria** H.-Sch. (13g). Bluish grey with 3 double white bands, the middle one the strongest, passing just distally to the cell, here rather strongly excurved, and only separated from the postmedian by a line; the subbasal well removed from the middle one; no discal spot; distal area broadly grey, entirely, or almost entirely, without a subterminal line. Caucasus to N. Persia.
- egenaria*. **E. egenaria** H.-Sch. (= *undosata* Dietze) (13g). Perhaps related to *tribunaria* but of a much less bluish grey (slightly tinged with brownish) and with distinct discal spots. The median area of the forewing is bounded by pairs of dark lines, the first of the distal pair particularly strong, somewhat thickened at the costal margin; two faint, sinuous median lines run from the inner margin to the discal spot; the pale subterminal line is distinctly indicated. The life history is not certainly known; it has been bred from larvae collected with those of *tripunctaria* and *virgaureata*, probably from an Umbellifer, but has also been reported as from the blossom of lime. Very local, S. France to S. E. Russia, also Livonia.

E. recens Dietze. Strongly built, brownish earth-grey, median area of forewing bounded distally by 2 parallel lines which bend strongly inwards; the proximal of them, which is the stronger, touches the large, elongate cell-spot at the origin of the 1st median vein. Fringe very distinctly chequered. Scheme of markings of *egenaria*, recalling also *innotata*. Koko-Nor and Sidemi. — **creta** Dietze is more uniform, duskier, perhaps more pointed-winged, the pair of postmedian lines equally strong, with sharper angles anteriorly (first basewards, then outwards). Issyk-kul; ? Kuldja. Probably a distinct species.

E. extraversaria H.-Sch. (= *libanotidata* Guen.) (12e). Not unlike *alliaria*, but with still larger, oblong, deep black discal mark, the lines remaining extremely fine, only the principal ones present, the antemedian without the two angles, the postmedian rather abruptly bent distally to the cell, both these lines and the sub-basal somewhat more conspicuous at the costal margin. Differs from *distinctaria* in having no light transverse lines. Larva on various Umbelliferae: Peucedanum, Libanotis, Pimpinella, etc. Imago at the end of June and in July; S. France to Russia and perhaps Transcaucasia.

E. centaureata Schiff. (= *oblongata* Thnbg., *boloniensis* Geoff.) (12d). Easily recognized by the white or whitish ground-colour, deep black discal lunule dark grey midcostal patch and light brown band proximally to the subterminal line. — ab. **obscura** Dietze. Ground-colour of both wings with a smoky suffusion. Perhaps developed chiefly in Asia but also recorded from the Tyrol. — In ab. **centralisata** Stgr., chiefly from Palestine and Central Asia, the markings are weaker, sometimes (except the discal mark) almost entirely obsolete. Often smaller. — Larva polyphagous on flowers, especially Umbelliferae and Compositae. The pupa usually hibernates, but sometimes produces the moth in a partial second generation. *centaureata* is found throughout the summer. Europe, N. Africa, Asia Minor, Central Asia, common and generally distributed.

E. subpulchrata Alph. is described as having the shape and habitus of *centaureata*, the colour and pattern of *pulchellata*. Forewing pale fleshy brownish, slightly more tinged with greenish distally, the basal and median bands bluish slate-colour, the latter with a slender band of the ground-colour in its middle. Hindwing greyish, darker in its basal part. Probably related to *gueneata*. Ili, Ferghana and Transcaspiia.

E. conviva Dietze has shorter palpus, is rather larger, narrower-winged, median band with less sharp pale line, its boundaries less sharply angled, etc. With the preceding.

E. accurata Stgr. Forewing longer and narrower than in *subpulchrata*, light grey with the dark median band oblique, the distal area mostly brownish, with light subterminal line, the fringes chequered. Namangan, N. Ferghana. — **inclinata** Dietze is darker, browner, markings more oblique, etc. Askhabad.

E. scalptata Chr. (13g) is similar to certain forms of *gueneata*, but distinguished by the white lines which bound and traverse the black-grey median area and especially by a broad white streak along the median vein which cuts the light-brown ground-colour and the median band. Shape intermediate between the two preceding. Transcaucasia and Transcaspiia. — **gluptata** Dietze is larger, broader-winged, the ground-colour more brownish (in *scalptata* almost silver-grey), the transverse lines somewhat less oblique and less straight. Alexander Mountains and Askhabad. Recalls *subpulchrata*.

E. saisanaria Stgr. Seems to be again similar, the longitudinal streak and the other veins in part brown-yellow, not white. Zaisan and N. Persia.

E. syriacata Stgr. (= *semicaesia* Warr.). Similar to *guenata*, but different, more or less, in all stages. Ground-colour less reddish, more leather-colour; median band blacker, rarely pale-bordered; proximal half of fringe less distinctly spotted; hindwing more unicolorous. Larva on Pimpinella cretica, May-June. The moth flies in the spring and is only known from Jerusalem and Beirut. According to STAUDINGER also the southern Taurus.

E. gueneata Mill. (12d). Bright red-brown with dark blue-grey, pale-margined median band, which contains a triangular patch of the ground-colour between the 3rd radial and 2nd median vein, reaching as far as the postmedian line. Larva on the umbels of Pimpinella saxifraga, full-fed in September. The pupae of *gueneata*, *syriacata* and *gratiosata* are, according to DIETZE, very remarkable in having no movable segments. At times two or three winters are passed in this stage. The moth appears in July and has a restricted range. — S. France, S. Tyrol, Italy, Carniola and Hungary. — **busambraria** Ragusa, from Sicily, is a pale, almost albinotic form, possibly due to disease. — **separata** Stgr. (= *pseudoseparata* Dietze), from Asia Minor, is a little larger, more ochreous than red-brown, but not so pale as *busambraria*.

- gratiosata*. **E. gratiosata** *H.-Sch.* (= *subseparata* *Chr.*) (12d). Median band similarly formed to that of *gueneata* but more traversed by white lines; ground-colour always glossy white. Very variable; in the typical form well marked. — *lavata* *Fuchs* from Sicily is somewhat larger and less sharply marked, but the differences do not seem important. — *pallida* *Dietze*, from Orenburg, perhaps only an individual aberration, is much lighter still, with the abdomen entirely white. — Larva on the seed-umbels of *Ferulago galbanifera*. Distributed on the Mediterranean littoral, and from the Balkan through Asia Minor to Central Asia. May—June.
- breviculata*. **E. breviculata** *Donz.* (13g). Easily known by the pure white ground-colour, brown basal patch reaching nearly to the black discal dot and brown apical half of the distal area of the forewing. Larva on flowers and seeds of *Ptychotis heterophylla*, an Umbellifer. The pupa hibernates, sometimes twice. S. Europe, France, N. Africa, Syria, Asia Minor and Transcaucasia.
- extremata*. **E. extremata** *F.* (= *glaucomictata* *Mann*) (13g) resembles *breviculata* but is somewhat narrower-winged, less pure-white, the markings less bright brown, the basal area more variegated, sharply dark-edged distally, the postmedian line represented by dark vein-dots (dashes), without the grey double line or band of *breviculata*, the distal patch on costal margin more restricted, not reaching the distal margin, more blue-grey than brown. Hindwing more strongly marked. Larva unknown; said to live on *Clematis* (*MABILLE*). Local in Central and South Europe, Asia Minor, Syria and Transcaucasia.
- stertzi*. **E. stertzi** *Rbl.* Affinities uncertain; recalls *Gymnoscelis*, but hindtibia 4-spurred. Wings rather elongate, whitish with a tinge of ochreous; forewing slightly more reddish costally and distally, basal patch dark fuscous, small, but almost united by dark shading with a narrow fuscous band, which arises before middle of costal margin and forms a strong curve or angle distally at the submedian fold; some blotches in the distal half of the wing, but leaving a clear area between the 3rd radial and 2nd median; fringe strongly spotted. Hindwing with curved transverse lines, strongest on veins and inner margin, a small dark inner-marginal patch close to base. Antenna in ♂ with slender fascicles of long cilia. Teneriffe: Orutava and Guimar in March.
- thalictrata*. **E. thalictrata** *Püng.* (13g). Dark grey-brown, the forewing with indistinct pale markings somewhat recalling those of *pumbeolata* or *valerianata*; from the costal margin to the subcostal and more or less on the veins these pale lines are generally rather more distinct, in particular the double line distally to the median area; subterminal line obsolete. Larva on the flowers and fruit of *Thalictrum foetidum*. The pupa hibernates, the moth emerging in May and June. Only known from Valais.
- actaeata*. **E. actaeata** *Walderdorff* (12f). A rather large, rather broad-winged species. The large discal mark and dark costal spots remind of *trisignaria*, but the postmedian is placed nearer to the cell-spot; a conspicuous whitish spot near the hinder angle of the forewing. — *bergunensis* *Dietze* is an essentially larger, more distinctly marked form from the Alps and the far north. — Larva on *Actaea spicata*, also, in the Alps, on *Thalictrum aquilegifolium*. The pupa usually hibernates, but sometimes produces a partial 2nd brood in September. The principal emergence is in July. Switzerland to East Prussia, also in Finland and again in Transbaikal, Amurland and the Ussuri district. Probably also in Japan (*DIETZE*).
- selinata*. **E. selinata** *H.-Sch.* (13g) is near *trisignaria* but may be distinguished by its broader median area, generally less thickened costal spots, weaker subterminal line, obsolete discal dot on the hindwing and according to *DIETZE* longer ciliation on the basal part of the ♂ antenna. Larva on the flowers and seeds of Umbelliferae, especially *Angelica*, *Peucedanum* and *Heracleum*. Moth in May, with a partial 2nd brood in July, distributed in Central Europe from the Pyrenees to the Ural. — *addictaria* *Dietze*, perhaps a separate species, is smaller, more ash-grey, less greasy-looking, discal spot of forewing smaller and rounder, the costal darkening of the lines slighter; forewing traversed, at uneven distances, by slender darker lines, of which about 12 can be counted on the costa; between them there are some scattered whitish-grey scales, especially distally to the median area, where they tend to form a double line. Hindwing almost unicolorous. Ussuri. — *tenebricosa* *Dietze* is an aberration (?) with a dark sinuous (S-shaped) band on the middle of the hindwing. Radde, Amur (1); Ural (1).
- trisignaria*. **E. trisignaria** *H.-Sch.* (12g). Moderately variable, though always obscurely marked. On the differentiation from *actaeata* and *selinata* I have already spoken above; the palpus is somewhat shorter than that of *selinata*. Sometimes the only distinct markings are the three dark spots (2 costal and the cell-spot) from which the species receives its name. Larva on various Umbelliferae, especially *Heracleum*, *Pastinaca* and *Angelica*. Moth May—July, distributed in Central Europe.
- latipennata*. **E. latipennata** *nom. nov.* (= *latipennis* *Warr.* nec *Hulst*) is a rather large species, characterized by its rounded costa, pointed apex and strongly oblique distal margin. Palpus long. Forewing fuscous, somewhat

mixed with ochreous, especially in the region of the veins and at the costal end of an inconspicuous double pale median band, which runs across the end of the cell to the middle of the hindmargin; other lines also inconspicuous, in places whitish, the subterminal a little more distinct, fine, whitish, dentate; cell-spot black, moderately elongate, terminal strokes thick, black; principal veins black, dotted with white where the lines cross them. Hindwing with apex prominent, though rounded; cell-spot and terminal marks as on forewing; costal one-third and cell rather light, the rest darker, lines chiefly indicated as white dots on the veins. Madeira: Rabaçal; only a ♀ known.

E. helveticaria Bsd. (12g). Very variable, sometimes very similar to the equally (or still more) variable *helveticaria*. *satyrata*, best distinguished by the presence of a dark dorsal belt near the base of the abdomen. In general also with more elongate forewing, more brownish tone, larger cell-spot (oftener repeated, though much smaller and weaker, on the hindwing), somewhat stronger lines bounding the median area, the postmedian less angularly bent than in the strongest-marked form of *satyrata* (*curzoni*), more indistinct (sometimes obsolete) subterminal line, rather more strongly spotted fringes, etc. I am doubtful whether the insect which passes in Britain as *helveticaria* (= f. *anglicata*) is the same as that of continental authors. CREWE was convinced that we have two species in Britain, but unfortunately I do not possess the one which he called *arceuthata*. As name-type DIETZE accepts a rather narrow-winged form from high altitudes in Valais, with the ground-colour about as chocolate with milk. Its larva is said to feed exclusively on *Juniperus communis* var. *nana*, but ANDEREGG recorded it from *J. sabina* — a further ground for uncertainty! The moth flies in June and July. In captivity partially double-brooded. — **anglicata** Mill., from Scotland, is another brownish form, rather smaller and broader, more reddish brown. The larva seems, according to CREWE's description, to be similar, but less blackish, the head purple, sometimes almost black, the anal extremity of dorsal line purplish, subdorsal and lateral perhaps less interrupted. Full-fed in September. — **intricata** Zett. (= *septentrionalis* Dietze). Mostly smaller and more slightly built, often lighter in colour (more ash-grey), the discal dot smaller. From the most northerly localities (Finland, etc.). Seems to me a form of the following. — **arceuthata** Frr. (12g). On an average rather broader-winged than *helveticaria*, the colour more grey, or violet-grey (less brown), the alternately dark and light spotted veins (which are characteristic of this species and *satyrata*) showing up more distinctly. Larva bright green, the pale subdorsal and broad yellowish white lateral lines uninterrupted. Grows very slowly, full-fed in late October or November. Widely distributed in Central Europe. — **robusta** Dietze is a powerfully built form which perhaps does not belong to this species. Markings similar but at the same time somewhat recalling *suboxydata*. Ground-colour with a strong admixture of brown, sprinkled with black and silver-grey. Radde, Amurland.

E. scopariata Rbr. (= *scoparia* Bsd., *tenebrosaria* H.-Sch.) (12h). Longer-winged than the preceding, with narrow hindwing. Antenna in ♂ with rather longer ciliation (at least $\frac{1}{2}$ as long as diameter of shaft). Median vein commonly conspicuously black except where crossed by the pale lines. Discal dot small, not elongate, often wanting. Abdomen with 1st segment, mediodorsal line and the incisions pale, otherwise more or less darkened dorsally. Described from Corsica; I accept the name as referring to the brownish form which occurs in Spain and Italy. — **multiflorata** Mill., from Cannes, Nice, Istria, etc., is more purplish, more sharply marked with white and fuscous. — **guinardiaria** Bsd. (= *graslinaria* Stgr.) denotes the larger, paler, more reddish-brown or ochreous-tinged forms which occur in Western to South-western France. — **matertera** Dietze is also large, but more sepia-coloured, weakly marked. Castile. — **farinosa** Dietze is a somewhat differently-marked aberration, or possibly distinct species, nearest *guinardiaria*, equally large but pale violet-grey, with a mealy appearance. Described from a single ♀, Cuenca. — **orientata** Stgr., from Transcaucasia and perhaps Transcaspia, may possibly be also a separate species. Said to be grey, almost entirely without brownish, weakly marked and without the whitish lines. — Larva on *Erica arborea* and *E. scoparia*; feeds throughout the winter, fullgrown February—March. Moth in April—May. MABILLE reports a second brood and Dr. CHAPMAN found it flying in abundance at the beginning of July at Canales, N. Spain.

E. rusicadaria Dietze. Broader-winged and essentially darker and less sharply marked than *scopariata*, presenting a very distinctive, dusky appearance; subterminal line of forewing sometimes forming a light spot near the hind angle, discal dot small but distinct; fringes beneath mostly more distinctly chequered than in *scopariata*. The genitalia also show some difference. Philippeville, Algeria, at street lamps in May. The larva accepted *Erica* in captivity but was not bred through.

E. veratraria H.-Sch. (12g). Very similar to *satyrata* but considerably larger, of a slightly different tone of colour (inclining to violet-grey), the discal dot stronger than is usual in *satyrata*, more often repeated on the hindwing, the principal lines generally extending into black spots at the costal margin of the forewing, the whitish subterminal spot near the posterior angle somewhat stronger. — **eynensata** Grasl. (= *magnata* Mill.) is in general larger, paler and more weakly marked. Recorded from the Pyrenees and Transsylvania.

— The larva lives spun-up among the seed-heads of *Veratrum*, on which it feeds. The pupa hibernates in a tough cocoon and sometimes passes 2 and even 3 winters in this state. The moth is found in July among the food-plant, in the mountains up to 2000 m, distributed in suitable places throughout Central Europe, also recorded from the Ussuri district.

invisa. **E. invisata** *Btlr.*, founded on a single worn ♂, would probably, if fresh, have about the colour of *veratraria*, possibly more that of a greyish *absinthiata*. It should be recognizable by its exceptionally broad median area, the pale outer band on both wings being placed unusually near the distal margin; this band is anteriorly not very strongly curved (though more so than in *subnotata*), is bordered proximally by blackish dots (not dashes) on the veins and traversed in the middle by equally distinct vein-dots; cell-spot as in *veratraria*; lines obsolescent; subterminal scarcely discernible; fringe very weakly spotted. Palpus a little over twice as long as diameter of eye; antenna rather slender, the ciliation minute; abdomen rather long and slender, with ferruginous subbasal belt. Japan: Hakodate.

fenestrata. **E. fenestrata** *Mill.* (13 h). Easily known by its very large size and white ground-colour, the transverse brownish lines best expressed on the costal margin of the forewing, sometimes also rather conspicuous on the veins. Palpus shorter than usual, face not very prominent. Variable. — Larva similar to that of *veratraria* but with more or less strongly developed yellow belts. Foodplant and habits the same. Imago in July. Extremely local: Alps of Southern France, Apezzo district, Carinthia, Carniola, Croatia and Herzegovina; a more strongly marked variety, *cretacea* *Pack.*, is widely distributed in North America. — **subfenestrata** *Stgr.*, from Achalzik, Transcaucasia, is perhaps another subspecies but its biology and anatomy have not been investigated. Slightly smaller, cleaner, more bluish white, weakly marked, underside of forewing less dark, whitish banded.

cerussaria. **E. cerussaria** *Led.* (13 g) is also a quite unmistakable species, much smaller than the preceding, the fine, very faint yellowish lines strongly dark-dotted on the veins. Palpus rather short. Areole very long and narrow but undivided. Asia Minor, Syria and Algeria.

cauchiata. **E. cauchiata** *Dup.* (12 g). Rather larger than *satyrata*, yet not generally so large as *veratraria*; ground-colour rather whiter or somewhat tinged with yellowish; the 5 dark lines of the median area more uniform in their expression, the 2nd to 5th parallel and equidistant; all are darkened where they cross the veins (as in both the species named) and somewhat darkened (at times thickened) costally; distal area somewhat darkened, *klosi*. the whitish postmedian band consequently rather well contrasted. — ab. **klosi** *Dietze* has the median area more or less strongly darkened. — Larva on golden rod (*Solidago virga-aurea*), rarely on species of *Aster*. *robertata*. Distributed in Central Europe and extending eastward to St. Petersburg. — **robertata** *Rougemont* has not yet been satisfactorily made known, being only described as "almost looking like a *Larentia*" (*Cidaria*); but figured (uncoloured) in *Iris* vol. 16, pl. 4, fig. 17. Apparently rather dark, the hindwing to some extent reproducing the design of the forewing. Believed by DE ROUGEMONT to be a distinct species. Bienne (Jura), one example, taken at light.

aggregata. **E. aggregata** *Guen.* Rather narrower winged than *cauchiata*. Testaceous yellowish, the lines exceedingly fine, vermiculated and so massed that definite bands can hardly be made out; only the subterminal well developed, fulgurated, straighter towards the hinder angle. Cell-mark extremely slender, white-surrounded. According to STAUDINGER variable. The type was from the Altai. Also recorded from the Ussuri district. — *fuscicostata*. **fuscicostata** *Chr.* (= *fuscostigma* *Alph.*) (13 h) is more whitish, though still with a tinge of yellow, the distal and costal margins of the forewing darker, the lines at the latter margin more strongly expressed. Occurs with the name-typical form, also at St. Petersburg, in Transcaucasia and in W. Central China.

pernotata. **E. pernotata** *Guen.* (13 h) has much in common with *cauchiata* and *satyrata* but is a quite distinct species. Mostly rather smaller than the former, more strongly marked, the costal and distal area of the forewing more tinged with rust-colour than the rest of the wing, discal dot usually distinct, though not very strong. Median area not sharply defined, the lines in the adjacent areas being about equally strong; white subterminal line generally well developed. Larva on the leaves of *Artemisia absinthium*. The moth appears in the first half of June and flies in the late afternoon or by day. Very local in Switzerland (Zermatt, etc.), not known elsewhere.

satyrata. **E. satyrata** *Hbn.* (= *grammaria* *Bsd.*, *fuscata* *Wrnbg.* nec *F.*) (12 h). Extremely variable, medium-sized to small, the wings of normal breadth or rather narrow; colour ash-grey or somewhat brownish grey, the alternate darker and lighter lines not very strong in most of the forms, the alternate black and white spotting of the veins generally very constant. Discal dot nearly always quite small but rarely wanting on the forewing; fringe very weakly spotted. Abdomen not dark-belted. HÜBNER's figure (the name-type) is not very satisfactory, but is moderately broad-winged, moderately strongly marked, rather too dark but probably intended to represent *strandii*. the commonest, ample-winged European form. — ab. **strandii** *Fuchs* is apparently a rather large, pale, whitish-dusted

form, differing from *callunaria* in being more strongly marked, the principal lines darkened on the costa. N. Norway: Vefsen. — ab. **nigrofasciaria** Dietze has the median area broadly darkened. Germany. — **transversa** Dietze. Median area only in part darkened, leaving pale transverse bands. Bavaria. — **bistrigata** Dietze. Only the boundary-lines of the median area dark. Baden. — ab. **caeca** Dietze lacks the discal dot. — **fagicolaria** (Crewe) Robs. and Gardn. is a browner form, approaching the colour of *helveticaria*, and prevails in the South of England. — **callunaria** Dbld. is a narrower-winged cinereous form, with pale lines. It inhabits heaths in the North of England and in Scotland and probably Finland and Iceland. — **curzoni** Gregson is still narrower winged but is very sharply marked, especially the thick antemedian and postmedian lines (the latter more angulated than in the other forms), sometimes also a dark line proximally to the subterminal. Very variable. Shetland Islands. — **subatrata** Stgr. is a nearly unicolorous dark form, occurring in most localities among the type, but prevailing in several Asiatic localities (Ferghana, the Alai Mountains, Ili district, etc.) — **limbopunctata** Dietze is a subform of *subatrata* with a prominent series of isolated light spots representing the subterminal. Berlin district, Württemberg, etc. — **concolor** Dietze is another subform of *subatrata*, unicolorous violet-grey with the discal dot obsolete. Juldus Mountains, Ili district. — **rivosulata** Dietze (= *serenata* Stgr.) is somewhat larger, lighter (dirty white with the lines grey, rather strongly marked), the whitish postmedian band clearer and broader. Known from the Altai and Tibet. — Larva polyphagous on flowers in July and August. The pupa hibernates. Very widely distributed in Northern and Central Europe and Central Asia, flying in May–June, in the far North in July. In Southern Europe more local, confined to the mountains. Doubtfully recorded from Amurland.

nigrofasciaria.
transversa.
bistrigata.
caeca.
fagicolaria.
callunaria.
curzoni.

subatrata.
limbopunctata.

concolor.
rivosulata.

E. tripunctaria H.-Sch. (= *albipunctata* Haw. nec Hufn.) (12f). Forewing dark grey with black cell-spot, the lines not very sharply defined, but the postmedian marked with black dashes on the veins; the subterminal characteristic, yellowish white, broken into dots, in part obsolete, a conspicuous spot near hind angle always present, usually also a moderately conspicuous one behind 3rd radial. Hindwing paler proximally and costally; a distinct white spot in the darkened part near the hind angle. — ab. **angelicata** Barrett (= *anglicata* Gmpbg.) is uniform smoky black, quite markingless except for the deeper black cell-spot. N. England: Yorkshire, etc. Larva on the flowers and seeds of Umbelliferae, chiefly Angelica and Heracleum, in September, a summer brood (less often noticed) on the flowers and leaves of elder (*Sambucus nigra*). The moths from the hibernated pupae appear in May. Throughout Central Europe, Livonia, the Balkans, etc.; also Transcaucasia, Transbaikal, Amurland and probably North America.

tripunctaria.

angelicata.

E. absinthiata Cl. (= *minutata* Schiff.) (12f). This species and the three which follow bear a tolerably close resemblance. *absinthiata* is rather light, glossy red-brown or purplish-brown, with moderate elongate wings, discal mark of forewing rather large, very black, costal margin of forewing in basal and median areas black-spotted, especially at the beginnings of the antemedian and postmedian lines, which otherwise are almost obsolete or quite weak, indicated chiefly by dots on the veins; subterminal line generally broken into small white dots or mostly obsolete, but always showing a pale posterior spot; fringe not appreciably spotted. Hindwing greyer, weakly marked. — ab. **obscura** Dietze is much darker, the forewing described as sepia-coloured. Kassimov, Central Russia. — The larva is polyphagous on Compositae, perhaps especially Senecio and Solidago; also on scabious and even on some Labiatae. The pupa hibernates; the moth does not appear until July and even August. Common and distributed in Northern and Central Europe, Russia, Altai and N. Tibet. — **lunata** Dietze is probably a distinct species. Almost unicolorous brownish, both wings above and beneath with large dark discal lunule, other markings scarcely perceptible; fringes strongly developed; ♂ antenna with longer ciliation, palpus perhaps somewhat longer. Juldus Mountains, Ili district.

absinthiata.

obscura.

lunata.

E. mandschurica Stgr. Forewing somewhat narrower than in *absinthiata*, dirty ash-grey without a tinge of brown. Described as a form of *absinthiata*, afterwards considered to be possibly a form of *actaeata*. Bureja Mountains, Central Amur.

mandschurica.

E. goossensiata Mab. (= *minutata* Dbld., nec Schiff., ? *callunae* Spr.) (12f). Smaller than *absinthiata*, slightly narrower-winged, rather greyer or less reddish, discal dot on an average smaller, median area sometimes appreciably greyer than the rest of the wing. Larva on Erica and Calluna. Moth in June–July, frequenting heaths. Local in Western Central Europe, also recorded from Finland and Russia. — **knautiata** Gregson is perhaps of a deeper, more reddish brown colour, differing little from dark *absinthiata*, though more the shape of *goossensiata*. BARRETT refers it to *absinthiata*, but Mr. BURROWS assures me that the genitalia disprove this. Larva on Scabiosa. Only recorded from Lancashire.

goossensiata.

knautiata.

E. expallidata Dbld. (12e). On an average larger than *absinthiata*; paler, more tinged with delicate violet-grey; discal mark still larger, generally also conspicuous (often fairly large) on the pale hindwing; costal spots of forewing also larger, deeper black; subterminal line often obsolete, when well developed usually accompanied by dark grey shading proximally. Larva rather more elongate than that of *absinthiata*; on

expallidata.

Solidago virga-aurea, feeding very late in the autumn. The pupa hibernates, sometimes twice. Moth in August. England to Switzerland and Austria.

- assimilata*. **E. assimilata** Dbld. (12f). Similar to *absinthiata*, but easily distinguished by its somewhat broader forewing, deeper colour, larger discal mark, more strongly developed subterminal spots, especially the posterior one, darker hindwing, with white dot or spot near anal angle, and especially by the spotted fringes. —
- grisescens*. **grisescens** Dietze, from Central Russia and Central Asia, is smaller and much more mixed with grey. — Larva on hop and black currant. Imago in May—June and again in August. The name-typical form inhabits Central Europe and Italy.
- vulgata*. **E. vulgata** Haw. (= *austerata* Hbn.) (12f). An inconspicuous species, in its typical form with the ground-colour similar to that of *absinthiata*, but much more distinctly traversed in the median area of the forewing and on the hindwing by fine waved grey lines; in well-marked specimens (as in HAWORTH's type) the median area shows 3 or 4 fine whitish lines between the dark ones. English specimens (except the melanotic forms) seem to be in general rather brighter reddish-brown than the continental. If they are racially separable, HÜBNER's name will be applicable to the latter. — **atropicta** Dietze (= *vulgata* Dietze nec Haw.) represents the strongly darkened (in extreme specimens almost black) form which is very common in London and has in England been erroneously known as *subfuscata* Haw. (see under *castigata*). — **montium** Dietze, from the Swiss Alps and the Tyrol, is grey without admixture of brownish. Scotch specimens also resemble this form. — Larva polyphagous, often eating withered leaves. Moth in May—June, distributed in Europe and Central Asia.
- niphonaria*. **E. niphonaria** Leech (13g). Superficially extremely like a rather dark, reddish, weakly-lined *goossensiata* but distinguished at once by the long palpus, which measures almost 3 times the diameter of the eye. Wings rather narrower, the forewing with more strongly dentate subterminal line, the hindwing more darkened at the inner margin. Underside rather more sharply marked. Japan.
- fulvipennis*. **E. fulvipennis** Btlr. (13h) resembles a diminutive *absinthiata* but the ground-colour is somewhat lighter, brighter fulvous-brown, the costal area of the forewing more strongly dusted with grey, the median area more strongly marked with grey lines or shading, the subterminal line little enlarged towards the hinder angle. Dharmasala, etc.
- carearia*. **E. carearia** Leech (13h). Shape of *niphonaria*, or the forewing somewhat more elongate still; slightly larger; colour of *fulvipennis*; median area slightly darkened, so as to form an extremely indistinct, narrow central band, only from the costa to the cell-spot darker and slightly broader; cell-spot rather larger, nearly round; costa basally slightly dark-shaded; subterminal line obsolete, indicated only by a few whitish scales here and there and a very indistinct spot near posterior angle, and by some very slight dark shading proximally to it. Hindwing scarcely lighter, with dark shading at inner margin proximally to the middle. Underside weakly marked. Palpus normal. Antennal ciliation quite short. Japan.
- signigera*. **E. signigera** Btlr. (13h). Darker than *carearia*, somewhat less fulvous, more strongly marked; discal spot of forewing more elongate, basal area, as well as median, marked with darker lines, apical part of costal margin also darkened, containing the distinct commencement of subterminal line, which is traceable in distinct whitish spots across the wing, all dark-shaded proximally, especially the posterior one. Hindwing with rather strong dark markings in basal and inner-marginal part and slightly in distal area. Discal dot distinct on both wings beneath. Palpus and frontal tuft long. Japan; Yokohama and Gifu.
- lepsaria*. **E. lepsaria** Stgr. Unknown to me. Said to resemble superficially *subfulvata* Haw., but narrower-winged and much darker. Dark black-grey without distinct discal dot or transverse lines, a dull brown longitudinal shade in and close behind the posterior half of the cell, not reaching the hindmargin, sometimes only weakly indicated and almost confined to the median vein; the veins distally also more or less of this colour. Lepsa, Ala Tau.
- vacuata*. **E. vacuata** Dietze is described as near *lepsaria* but larger, lighter, broader-winged, almost entirely markingless, brownish; fringes not chequered; antennal ciliation shorter and denser. Issyk-kul and Togus-Torau (Ferghana).
- denotata*. **E. denotata** Hbn. (= *campanulata* H.-Sch.) (12f). Glossy brown, in general less reddish than *absinthiata*; discal dot rather large but more roundish than elongate; lines very weak, even on the costal margin rarely much accentuated, the postmedian often rather better marked, especially on the veins, followed distally by a slightly pale band (double line); subterminal line discernible but rather weak, not really white, only a little widened near the hinder angle. Hindwing paler, rather well marked, especially beneath, where the postmedian

is rectangularly bent at the 3rd radial. Variable in size and colour. — ab. **solidaginis** *Fuchs* is clear dark *solidaginis*. slate-grey without a tinge of brown. Said to have been bred from *Solidago*. — **atraria** *H.-Sch.* (= ? *primulata atraria* *Mill.*, *ferreata Fuchs*) is a dark (greyish or blackish) mountain form, generally of larger size, rather strongly marked. Larva on *Phyteuma*. — **jasioneata** *Crewe* is very similar to *atraria* but in general smaller and even *jasioneata*. darker and stronger-marked, possibly with slightly narrower wings. Larva on *Jasione* in the west of England and in Ireland. Possibly a separate species. — **livida** *Dietze* is again similar to *atraria*, but of a more leaden *livida*. colour and more weakly marked. Juldus Mountains. Similar but smaller examples in other localities in Central Asia. — **difficilis** *Dietze*. Small, dark earth-grey, all the markings except the light subterminal almost *difficilis*. entirely obsolete; discal spot small. The antennal cilia of the ♂ are longer at the base of the shaft; therefore probably a separate species. Northern Alai, etc., at 3400 m elevation, in August. — Larva rather compact, skin with slight granulation; setae strong; grey-brown with wedge-shaped dark dorsal markings. On *Camp-nula*, especially *C. trachelium*, concealed in the seed-capsules or seed-heads, on which they feed. Moth in June or July. Distributed in Europe and Western Asia, reaching as far as N. Tibet.

E. castigata *Hbn.* (= *subfuscata Haw.*, *compressata Guen.*) (12g). Pale grey with a slight tinge of *castigata*. yellowish, pretty regularly traversed by dark grey waved lines. Superficially somewhat similar to *jasioneata* but less long-winged, postmedian line of hindwing less near the discal dot, etc. Also to *lariciata*, but rather less sharply marked, lines rather less angulated, discal dot in general less large, thorax without posterior dorsal white spot, antennal ciliation in the ♂ shorter. — ab. **obscurissima** *ab. nov.* is a perfectly uniformly black *obscurissi-* melanotic form, like *tripunctaria* ab. *angelicata*, only the discal mark more intensely black. I have bred it from *ma*. Lancashire, from nettle, and it is known from other British localities. — Larva polyphagous on trees, flowers, etc. The moth is very common in May—June, sometimes even in July. Widely distributed in the Palearctic Region and probably in North America. — **ussuriensis** *Dietze* is much smaller and is treated by *DIETZE* as a *ussuriensis*. local race of *castigata* but as *PETERSEN* has found a slight difference in the genitalia (bursa-case in large part quite free from spines, etc.), it may probably be a separate species. Ussuri and Amurland, perhaps also Japan.

E. biornata *Chr.* Wings elongate, forewing light grey with the base and a longitudinal stripe in the *biornata*. middle of the wing pale yellowish (just the colouring of *Cucullia biornata*), anteriorly straight edged; transverse lines indicated; a fine black discal dot; apical region with scattered black scales. Hindwing white-grey, the inner margin with the beginnings of numerous dark lines. Distal margin of both wings blackish. Sarepta. Also (perhaps a local race) in the Ili district. The larva is suspected of feeding on *Artemisia*.

E. kuldschaensis *Stgr.* (= *biornata Alph.*, nec *Chr.*). Very near the preceding, wings less elongate, *kuldscha-* palpus shorter. The ground-colour of the forewing is very light grey, the yellowish tinge only weak, the *ensis*. median vein and its branches and also the submedian marked with blackish dots. Kuldja.

E. aequata *Stgr.* (= ? *diffisata Dietze*). Very like *kuldschaensis*, rather darker and purer grey, with *aequata*. scarcely any tinge of yellow and without the sharply defined grey costal area of the two preceding species. Ferghana.

E. ochrovittata *Chr.* (13h). Forewing elongate and rather acute, coloration somewhat as in *biornata. ochrovittata*. *CHRISTOPH* compares it with *denticulata*. Costal and posterior areas cinereous, the latter broadly, a stripe between, finally directed towards the apex, ochreous. Numerous oblique, nearly parallel whitish lines cross the wing. Hindwing whitish yellow, tinged with grey, broadly grey distally, weakly marked except towards the inner margin. Transcaucasia.

E. bohatschi *Stgr.* Smaller, broader and rounder-winged than *succenturiata* and *icterata* and distin- *bohatschi*. guished at once by the arrangement of the colours, the white occupying nearly one-half the forewing proximally (oblique, most extended anteriorly), a dark brown colour distally. S. E. Siberia.

E. barteli *Dietze* is said to resemble a diminutive *icterata* with the cinnamon-brown colour confined *barteli*. to a triangular patch at the forking of the median vein. Antennal ciliation in ♂ not quite as long as diameter of shaft. Uralsk.

E. lucigera *Btlr.* (13h) is a very distinct species. Rather narrower winged than *succenturiata*, with a *lucigera*. still larger, raised discal spot or tuft of scales, distal area darker, almost obliterating the subterminal line, posterior half of forewing and whole hindwing strongly darkened. Dharmasala.

E. sophia *Btlr.* (13o). Ground-colour white, showing chiefly near the base and in the cell of forewing *sophia*. and on the hindwing. Costal margin of forewing mostly brownish, distal area and posterior part of median area more rust-coloured, but of a peculiar pale shade. Japan. — **sinicaria** *Leech* is larger, perhaps rather *sinicaria*. longer winged, the veins much more strongly dark-dotted, hindwing more strongly marked. W. China: Che-tou.

- icterata*. **E. icterata** Vill. (= *intermedia* Dietze) (12h). DE VILLERS, who first described the species usually called *subfulvata* Haw., indicates the most brightly-marked form which is yet known from the south of France, for he definitely mentions the "broad yellow fascia". This form is widely distributed in Central Europe. —
- subfulvata*. **subfulvata** Haw. (12h), from England and Hamburg, has a large, very clear ferruginous area, not perceptibly crossed by greyer lines; margins of forewing and nearly the entire hindwing generally dark. —
- oxydata*. **oxydata** Tr. (12i) is a more marbled form, the fulvous part consequently less sharply defined though still conspicuous. Widely distributed; in the Middle Rhine district the only known form. —
- dietzei*. ab. **dietzei** nom. nov. (12i) has the thorax and basal part of the costal area of the forewing whitish, otherwise about as *oxydata*. DIETZE calls this form *cognata* Steph., but this is inaccurate. —
- cognata*. **cognata** Steph. (= ? *ligusticata* Donz., *ferruginata* Dup.) (12i) is marbled with whitish, blackish and ferruginous, without any distinct clear, area of the latter colour unless about the median nervules; in extreme cases scarcely any fulvous shade is discernible (*excelsa* Dietze, a "superfluous name"). — Larva on *Achillea millefolium*; in some districts on tansy; rarely on *Artemisia*. Feeds later in the autumn than the following species. Moth in July—August, distributed in Central and Northern Europe. ? Central Asia.
- succenturiata*. **E. succenturiata** L. (12h) is very closely related to the preceding, yet biologically and anatomically distinct. It differs in having the ground-colour and a great part of the thorax pure white. In LINNÉ's type the central part of the forewing is pretty clear white. —
- disparata*. ab. **disparata** Hbn. (12i) is a form with rust-coloured posterior suffusion. —
- exalbidata*. **exalbidata** Stgr. (12h) shows the opposite extreme, the dark markings even at the costal and distal margins (and on the hindwing) being much reduced. In Turkestan, Ferghana, the Ili district, etc., it is the prevailing form, but it is not rare as an aberration in Europe. — Larva in August—September, or into October, chiefly on the leaves of *Artemisia vulgaris*, or sometimes on the flowers and seeds. Imago in June—July. Distributed in Northern and Central Europe and extending eastward through Central Asia to the Alexander Mountains.
- tarfata*. **E. tariffata** D. Luc. is described as a variety of *succenturiata*; this can scarcely be correct, but I cannot at present identify it. Wings more rounded, lines less distinct than in *oxydata*, which it is said to resemble. Brownish grey, white marked; not reddish. According to the figure, the postmedian line is further from the cell-spot, less broken near the costa and the subterminal forms an inward angle or bend in the submedian area. Tarf, near Calle, N. E. Algeria.
- denticulata*. **E. denticulata** Tr. (12i). Not quite so broad-winged as *succenturiata*, the white ground-colour of the forewing strongly tinged with yellowish, discal dot smaller, dark margin narrower, subapical pale streak broader. Larva on the flowers and seeds of *Campanula rotundifolia*. Pupa hibernates. Imago in July in rocky places. Valais, Germany, Hungary and Asia Minor.
- lacteolata*. **E. lacteolata** Dietze possibly belongs near *denticulata*. Large, pure white, costal margin of forewing dusted with umber scales, dark vein-dots indicating the postmedian, scattered dark scales distally, otherwise very weakly marked. Slightly more elongate than *denticulata*. Kasikoparan, Transcaucasia.
- impurata*. **E. impurata** Hbn. (= *modicata* Hbn., *proluaria* Frr.) (12i). Ground-colour white, but strongly dusted with bluish grey and with a slight (occasionally strong) admixture of rusty yellowish, especially on the veins; discal dot of moderate size; transverse markings more strongly expressed than in *denticulata* and *succenturiata*; costal and distal areas not specially darkened. Hindwing well marked, beneath with the light postmedian band much broadened. Larva on the flowers and seeds of *Campanula rotundifolia* or occasionally on other allied plants. The pupa hibernates. Imago in July, on rocks. Pyrenees, Alps and Taurus, also said to occur in Belgium.
- nephelata*. **E. nephelata** Stgr. differs from *impurata* in being brownish grey, generally darker and more strongly marked than *semigraphata*; the apical part of the costal region is conspicuously darkened. Hindwing with 6 darker lines in the narrow inner-marginal part, the 2 distal ones continued as dark dentate lines more or less across the wing. Underside much lighter than in the 2 species named, weakly marked. Uliassutai district and Korla.
- lithographata*. **E. lithographata** Chr. (13h) from Ordubad (Armenia), is described as having the wings elongate, whitish, ochreous-mixed, with black discal dots and some interrupted geminate, denticulate fuscous-cinereous lines, usually more or less indistinct. Related to *graphata* but a little narrower-winged. According to STAUDINGER very near the following but distinct. BOHATSCH says it is more reddish tinged.
- poecilata*. **E. poecilata** Püng. Related to *semigraphata* but quite differently coloured, being light yellow-reddish, the markings sharper but less connected than in the allied species, giving it a more variegated, chequered appearance. Corsica and Sardinia.

E. unitaria *H.-Sch.* (13h). Similar to *impurata* but easily distinguished by the shorter, blunt palpus, *unitaria*. which only projects about half a length beyond the eye; antennal shaft in ♂ apparently somewhat thicker, less distinctly dark ringed, ciliation somewhat longer. Discal dot mostly smaller and less distinct. Underside lighter, weakly marked. S. Spain and N. Africa. — **desertorum** *Dietze*, from Tunis and South Oran, is *desertorum*. somewhat smaller and more yellowish-tinged. — Larva on *Diplotaxis pendulum*. The pupa hibernates. The moth appears in the early spring in Tunis, later in S. Spain. — **orana** *Dietze* may possibly belong here, but *orana*. all the markings are blackened, only the inner half of the distal area of the forewing and a band on the hindwing light. Oran, only a single ♀ known.

E. amplexata *Chr.* (13i) is said to be probably near to *subumbrata* but with the bands red-brown and *amplexata*. differently arranged, wanting the dark angled band which in *subumbrata* touches the cell-spot; distal margin spotted, in *subumbrata* unicolorous. Amur and Ussuri.

E. orphnata *Bohatsch* was earlier believed to be a form of *subumbrata*, but *DIETZE* has detected a *orphnata*. difference in the ♂ genitalia. Brownish grey, not white, the cell-spot often larger than in *subumbrata*; abdomen and subcostal and median veins of forewing with an admixture of rust-colour. Forewing sometimes more elongate. Underside variable, mostly more strongly darkened than in *subumbrata*, in particular with the cell-spots commonly larger. ♂ antenna more distinctly ringed with black. Larva on the flowers and seeds on various Umbelliferae, etc. The pupa hibernates. The moth flies in June. S. Europe from the Pyrenees to Hungary; Ferghana.

E. subumbrata *Schiff.* (= *scabiosata* *Bkh.*, *piperata* *Steph.*, *majoraria* *Lah.*, *obrutaria* *H.-Sch.*) (12i). *subumbrata*. Rather long-winged, whitish, forewing with numerous parallel grey lines, commonly less distinct in the middle of the wing; discal dot small; distal area of both wings usually somewhat darkened; the principal veins sometimes rust-yellowish. Areole double. Antennal ciliation in ♂ not quite as long as diameter of shaft. — ab. **aequi-** *aequi-*
strigata *Stgr.* *strigata*. *DIETZE* sinks this to the preceding, but it is diagnosed as being equally strongly fuscous-lined throughout and I have examples agreeing with this diagnosis. — **limbofasciata** *Dietze* is a chiefly Asiatic form, *limbo-*
fasciata. less sharply marked in the pale part of the wings. — Larva extremely slender and elongate. On various Compositae, Umbelliferae, etc., eating the flowers. The pupa hibernates. The moth flies from the end of May to July, and is widely distributed in Europe and Central Asia.

E. semigraphata *Brd.* (= *nepetata* *Mab.*) (12i) agrees with *subumbrata* in having the areole double, but *semi-*
graphata. in appearance closely resembles *impurata*. Mostly smaller, perhaps somewhat broader-winged, generally rather darker and less sharply marked, the discal dot often smaller, the hindwing with postmedian line rather further from the discal dot, rather more angulated in the middle, on the under surface generally rather sharply expressed, the light band which follows it less broad. Very variable. — ab. **valida** *Dietze* (= *ochroradiata* *Preissecker*). *valida*. Darker, violet-grey with copious admixture of rust-yellow, especially on the veins. Appears to be the principal form in S. Germany and the higher altitudes in the Tyrol. — ab. **arida** *Dietze* shows the opposite extreme, *arida*. perhaps due to heat; quite small, mostly whitish. — **canariensis** *Dietze*. Similar to *valida*, build more robust, *canariensis*. the black markings, especially the cell-spot, strongly developed. Canary Islands. — Larva on various species of *Calamintha*, on thyme, etc. The pupa hibernates, emerging in July-August. Distributed in warm, rocky places in Central and S. Europe and W. Asia, as far as to Armenia.

E. millefoliata *Rössl.* (= *achilleata* *Mab.*) (12h). Shows some superficial resemblance to *icterata cognata* *millefoliata*. but is rather narrower-winged, paler, without rust-coloured admixture, the subterminal line (when developed) less strongly dentate, etc. Antennal ciliation less short. Areole double. — **maeoticaria** *Bohatsch* was founded *maeoticaria*. on captured, not bred, specimens and will perhaps prove untenable. Whitish grey instead of brownish grey, the markings therefore appearing more distinct. Recorded from S. E. Russia, Transcaucasia and the Taurus. — Larva among the flower- and seed-heads of *Achillea millefolium*. The moth flies in June and July and inhabits Central and Southern Europe, Asia Minor and Transcaucasia.

E. brevifasciaria *Leech* (13i) is very distinct, and will perhaps prove to be a *Horisme*. Hindwing *brevi-*
fasciaria. larger than in normal *Eupithecia*, sharply marked, the dentate line distally to the light band very noticeable; median band of forewing darkened in costal half. W. China: Chow-pin-sa.

E. subnotata *Hbn.* (= *simpliciata* *Haw.*) (12g) also belongs to the group with divided areole, but this *subnotata*. — as already remarked — does not seem a natural one. The coloration is not striking, but *subnotata* is at once distinguished by having the postmedian line not angled, nor even noticeable curved, near the costal margin. Discal not generally small, mixed with brown scales, subterminal line strongly dentate behind the middle of the wing, then forming a strong curve, but not or scarcely thickened. — **collustrata** *Dietze*, from *collustrata*.

Issyk-kul, etc., is essentially paler, but is founded on captured specimens. — Larva on flowers and seeds of *Atriplex* and *Chenopodium*. Imago at the end of June and in July; the name-typical form distributed in Europe and Asia Minor.

druentiata. **E. druentiata** Dietze. Another doubtfully-placed species with double areole. I have no material, but according to its author it shows a remote resemblance to *millefoliata*; more coarsely scaled, the coloration still more irregularly composed of dark and light elements "as if sprinkled with pepper and salt". Discal spot larger and deeper black, fringes more strongly chequered. Veins in the distal part of the median area marked with dark streaks. Underside similar to that of *arceuthata*, but more strongly dusted with whitish and blackish. Body robust; abdomen with brownish belt dorsally. Larva on flowers and seeds of *Artemisia camphorata*. Moth in May—June, only known from Southern France and Istria.

marginata. **E. marginata** Stgr. is probably related to *subnotata*, agreeing in build, ground-colour, in the scarcely indicated discal dot, light, scarcely marked hindwing, weakly marked underside, etc. But it shows, like *icterata*, a sharply differentiated, rather broad grey costal stripe on the forewing. A silky gloss is manifest on the wings. Lebanon, Taurus, Transcaucasia and the Ili district.

bella. **E. bella** Stgr. is said to differ from all the other species in the clear light chestnut brown ground-colour of the forewing. Costal margin with dark and white strigulation, two whitish spots distally to the cell-spot, the first indicating the beginnings of two whitish lines, the second large, separated from the first by a quadrate blackish spot; a black, white-bordered spot near anal angle; the usual transverse lines indicated. Ussuri: Sutschan district.

subtiliata. **E. subtiliata** Chr. appears to be similar to the preceding but perhaps longer winged, the ochreous lines still weaker, only two in the middle darker, right-angled anteriorly, enclosing a small indistinct discal dot. N. Persia and Transcaucasia.

suboxydata. **E. suboxydata** Stgr. (13i) represents a variable species, or group of species, of which the life-history is not yet known. Nearly of the size of *subfulvata*, wings narrower, especially the forewing, less sharply marked. The lines of the forewing, so far as recognizable, seem less waved or dentate, 3 blackish lines stand close together near the base, the subterminal is rudimentary, not dentate, but broken up into dots or short streaks. Hindwing dark grey. Possibly, according to DIETZE, related to *druentiata*. The name-typical form, from the Amur and Ussuri district, is grey. — **minorata** Dietze is smaller, likewise grey but more sharply marked; median area darkened, conspicuously light-bounded distally. Ili district. — **subbrunneata** Dietze, from Amurland, is a large, strongly brown-tinted form, sometimes almost without markings, excepting the black cell-spot. Possibly a separate species. — **amita** Dietze is a brownish-grey form from Koko-Nor, but as it seems to differ appreciably in the ♂ genitalia it will probably have to be raised to specific rank. — **pallida** Dietze, from Aksu, seems to be a somewhat paler desert-form of *amita* and is perhaps not worth naming. — **cinnamomeata** Dietze may also be a form of *amita*. Smaller, duskier; more sharply marked with brown. From East Turkestan and the Ili district. — **patruelis** Dietze is a doubtful form, reminding superficially of *vulgata*, from which it is at once distinguishable by the shorter palpus and more strongly chequered fringe. — **moecha** Dietze is probably, according to the appearance of the ♂ genitalia, another distinct species of the *suboxydata* group. DIETZE was at first inclined to refer it provisionally as a form of the sharply white-marked *bella* Stgr. but it is superficially more like *absinthiata* on account of its uniformly brown colour. Sarepta and Uralsk. I have no personal knowledge of the species of this group.

sinuosaria. **E. sinuosaria** Ev. (12m) is a striking species and very easy to distinguish among the European forms, its closest allies (or representatives) being Asiatic. Only to *lanceata* does it bear even a general resemblance and from this it differs so considerably in its less elongate wings, darker, richer and more varied coloration, etc., that a detailed comparison is unnecessary. Areole double. The range extends from Königsberg (Prussia) through Eastern Europe to Central Asia. — **pallesceus** Dietze is pale clay-coloured, even the brown and blackish parts of the type only becoming dark clay, the discal spot alone remaining blackish. It seems also rather shorter-winged; yet it is connected with the name-type through the following form. *pallesceus* is known from Aksu and Yarkand. — **modesta** Dietze, from the Alai Mountains (Ferghana) is intermediate in coloration between *sinuosaria* and *pallesceus*. — **obliquaria** Leech is probably nothing more than a large, sharply marked form of *sinuosaria*; the blackish blotch between the radials, extending from the subterminal line almost to the post-median, and thick black marks on the veins distally, between this blotch and the termen, are very conspicuous. Ta-chien-lu, W. China. In one of the two examples the dividing-vein of the areole is obsolete. — Larva on the flowers of *Atriplex* and *Chenopodium*. The pupa hibernates, producing the moth about June.

E. rubellata Dietze. Very distinct. Coloration and markings much as in *subnotata*, rather more mixed with white, especially the body, the forewing at base and the hindwing; sometimes more reddish. Shape and structure more as in *sinuosaria*, but the areole undivided; palpus rather short. Discal dot almost or altogether obsolete. Central Asia: Korla; Sinin; Aksu. — **scotaeata** Dietze is a more blackish form from the Ili district. — **deserticola** Dietze is a more clay-coloured form from Altyn Tag.

E. distinctaria H.-Sch. (= *constrictata* Guen., *albifronsata* Grasl., *heydenaria* Stgr.) (12 e). A small species, of unusually clear grey colouring, without admixture of brownish. Discal spot very conspicuous, elongate; lines very fine, mostly indistinct, the basal, antemedian and postmedian widened to triangular or oblong black spots on the costal margin; all, moreover, are rather distinctly marked on the veins, especially on the median. — **sextiata** Mill. is a lighter grey or whitish, rather strongly marked southern form, best known from Southern France. — Larva on *Thymus serpyllum* and *T. vulgaris*, eating the flowers and seeds. Moth ordinarily in June and July. Very local but widely distributed in Europe, especially in the South; also in Asia Minor, Syria and Transcaspia. It rests by day on rocks or stones.

E. amasina Bohatsch. Rather larger than *distinctaria*, forewing broader yet more pointed, antenna similar, palpus longer, more as in *silenicolata*. Markings faint, arranged much as in the last-named. Hindwing almost markingless, discal dot minute and inconspicuous. Amasia.

E. laterata Dietze. Rather larger and more elongate than *distinctaria*, distinguished at once by having a dusting of seal-red scales; markings somewhat weaker. Schahkuh, Central Asia.

E. subtilis Dietze may be compared with *distinctaria*, but is smaller and lighter, with much narrower and more pointed wings, discal mark narrower, antennal ciliation much shorter. The genitalia show much in common with *centaureata*. Schahkuh, Persia.

E. gemellata H.-Sch. (12 m) is a small species, the body very robust in proportion to the wings; yellowish grey, the discal spot distinct, not very large, inclining to a triangular form; lines (about 10 in number) sharply expressed, rather angularly waved, the angle in the postmedian line sharp; veins more or less rust-coloured. Under surface strongly marked. — ab. **schmidii** Dietze (= *bistrigata* Dietze) has only the antemedian and postmedian lines well expressed, though these are at times thickened into bands (*bistrigata*). — ab. **nigrofasciaria** Dietze has the entire median area darkened. — Larva on the flowers and seeds of *Tunica saxifraga*, in two generations. Pupae from autumn larvae hibernate. Flies in May and again in August, in rocky districts in South Europe and Asia Minor. — **mystica** Dietze is a much larger, sharply marked form (or perhaps allied species) from Akbes, Syria.

E. relictata Dietze is said to be near *gemellata*, wings more pointed; dusty grey, the markings more extended, less sharp. Tekke and Alexander Mountains, Central Asia.

E. cooptata Dietze is also compared with *gemellata*; larger, wings not so broad and short, the postmedian line mostly interrupted between the 3rd radial and 2nd median; a black streak on the median before its bifurcation. Very variable. Digne.

E. ogilviata Warr. Small and very narrow-winged, the cell of the forewing rather long. The only known specimen is in very bad condition. Coppery fuscous, the markings almost lost, but evidently at best only weak and not numerous; forewing with a discal dot indicated and a thick, dark postmedian line, somewhat angulated about the 1st radial; distally to this line the wing is somewhat paler. Antennal ciliation in ♂ not so long as diameter of shaft. Azores: Central Fayal.

E. graphata Tr. (= *corticulata* Frr., ? *italicata* Guen.) (12 k). Not unlike *denticulata* or *semigraphata* in colouring, perhaps on an average with more brownish or yellowish admixture; slightly narrower-winged, more strongly marked, the pattern more completely broken up into numerous lines; discal dot small; postmedian line rather near the discal dot, on forewing less sharply broken near costa, on hindwing less bent in the middle; subterminal line irregular, thickening near costa and in middle; terminal line of dashes sharply expressed; fringe distinctly chequered. Underside well marked. — ab. **brunnea** Aigner is described as grey-brown with the median area darker. — Larva not certainly known. The moth is found throughout a great part of the summer. Unlike most *Eupithecia*, it rests with the wings slightly raised, as if prepared for flight. Typical *graphata* is only known from Austro-Hungary, perhaps including Bosnia. — **setaceata** Dietze. This and the following forms are provisionally treated by DIETZE as subspecies of *graphata*, but their exact status is still uncertain. In *setaceata* the egg, according to DRAUDT, shows much larger pitting and other differences which indicate a species. The wing-markings appear more dusted than in *graphata* and the colour inclines more to

bluish than to brownish, in S. France producing intergrades to *drypisaria*. Larva on Alsine setacea. Basses-sproengerts. Alpes, Valais and probably Aargau. Most likely a less glossy form of *mayeri*. — **sproengerts** Dietze (= ? *italicata* Dietze olim, ? *Guen.*) somewhat intermediate in appearance between *graphata* and *setacea*, slightly larger than the latter, broadly lighter in the inner part of the distal-marginal area. Bred specimens (from Alsine), however, seem scarcely distinguishable from *setacea*, with which also the larva agrees. Central Italy. GUENÉE's type *mayeri* of *italicata* was smaller and is referred by STAUDINGER as a dwarfed *satyrata*. — **mayeri** Mann, is similar to *setacea* but more brownish grey, differing from *graphata* in the less sharp markings, the veins less yellowish. The series before me shows a more glossy, less white, less sharply marked insect, discal dot small, fringes very weakly spotted, abdomen dark-belted. It used to occur near Vienna in August, but the locality has been destroyed. *riparia*. The larva was found on Alsine austriaca and altogether resembled that of *setacea*. — **riparia** H.-Sch. (= ? *drypisaria* Dietze, *drupisaria* Petersen). Bluish-tinted when fresh; much whiter and still more weakly marked than *mayeri* (with which PÜNGELER, in litt., has united it), thus presenting a very different aspect from *albofasciata*. typical *graphata*. Fiume, Croatia, May—June; ? Majella, Central Italy. — **albofasciata** Stgr. is possibly only a worn example of one of the forms of *graphata*. Said to be characterized especially by a broad white dentate distal band, between which and the distal margin stands on the forewing a further sharp white line. Its connection with *graphata* did not strike STAUDINGER and so he gives no comparative description. Amasia.

indigata. **E. indigata** Hbn. (12d). Easily known by its very elongate brownish-grey or somewhat darker violet-grey forewing, somewhat paler hindwing and nearly obsolete markings excepting the large, elongate black discal spot of the forewing. — **turfosata** Draudt, from East Prussia and Livonia, the larvae on the blossom of *Pinus sylvestris* var. *turfosa*, is somewhat more stoutly built, darker, with the markings more numerous and more distinct. Examples from Paisley (Scotland) rather approach this form except in their build. — Larva on *Pinus sylvestris*. Moth in May, sitting on the trunks or branches of pine. Widely distributed in Europe; probably also in Transcaucasia and perhaps other W. Asiatic localities.

scortillata. **E. scortillata** Dietze. Rather small, elongate, yellowish, ♂ more leather-colour, ♀ whiter; forewing with strikingly strong, elongate deep black discal spot and 2 large, less dark costal spots. By thinking of a cross between *indigata* and *irriguata*, only with larger, longer cell-spot, one may get an idea of this species. Togus-torau and Zerafshan, Central Asia.

pimpinellata. **E. pimpinellata** Hbn. (= *denotata* Guen. nec Hbn.) (12e). A rather large species. Forewing somewhat elongate, at least in the ♂; hindwing not narrowed. In its typical form easy to recognize by the delicate mixture of red-brown and grey in the forewing, large discal spot and the series of black costal spots at the beginnings of the lines, from base to postmedian. The lines themselves are chiefly expressed as dots on the veins. — **altaicata** Guen. is a more greyish, white-mixed form, the distal area somewhat darker than the rest. *cinerascens*. Coloured more like *euphrasiata*. Altai. — **cinerascens** Tgstr., from Finland, is according to STAUDINGER transitional towards *altaicata*. — **lantoscata** Mill. is likewise intermediate. Grey like *cinerascens*, but more strongly marked, with larger discal spot. Except in colour, not differentiable from the name-typical *pimpinellata*. Digne, Zermatt, S. Tyrol. — **elongata** Dietze, from Central Italy, is narrower-winged, ash-grey, the principal lines sharply expressed, less broken up into dots. — **assimilis** Dietze is described as more elongate than the typical form, earth-grey, ♀ only slightly more brownish, with less and weaker markings, the discal spot smaller. Ili district. — **limbosignata** Dietze is brown with the light subterminal line of both wings very sharply expressed. Kuldja. — Larva on *Pimpinella* or occasionally on other Umbelliferae, September—October. The moth appears in July and early August. The name-typical form is widely distributed in Northern and Central Europe.

cohorticula. **E. cohorticula** Dietze. is described as light earth-grey, with the darker, sepia-coloured, slightly waved markings less regular than in *subsequaria*, from which it further differs in its larger size and longer wings. Discal dot weak or wanting; median area weakly defined by darker lines proximally and distally, the transverse lines of the forewing continued on the exposed inner-marginal part of the hindwing; subterminal line extended, in the inner angle slightly broadened. Under surface pale, still less distinctly marked. Fringes weakly chequered. Abdomen belted with sepia-grey. Cilia of ♂ antenna somewhat shorter than diameter of shaft. Karagai-tau, Issyk-kul.

subsequaria. **E. subsequaria** H.-Sch. (13i). Systematic position somewhat doubtful. Moderately large, light ash-grey, the veins of the forewing clay-yellow, submedian and 2nd median least so, 2nd and 3rd radials and 1st median as far as the base; the markings very uniform throughout, consisting of the usual alternations of dark and light lines, sharply marked, the postmedian much less angulated than in *scabiosata*; discal spot wanting. Amasia.

euphrasiata. **E. euphrasiata** H.-Sch. (= *constrictata* Mill. nec Guen.) (12e) has nearly the same delicate ash-grey ground-colour as some forms of *pimpinellata*, the reddish brown admixture less strong than in the name-

typical form but stronger than in *distinctaria*, which it slightly recalls. On an average smaller than *pimpinellata*, somewhat longer-winged, cell-spot rather smaller, subterminal scarcely widened, but forming an angle inwards on the fold. Median area rather narrow. — **vellicata** Dietze, from Urumschi (E. Turkestan) lacks the black costal spots of the forewing. — Larva on *Odontites lutea*. The pupa hibernates. The moth flies in August—September in warm sandy or stony places where the food-plant grows. Distributed in Southern and Central Europe. *vellicata.*

E. assectata Dietze. Moderately large, sepia-grey, irrorated, with numerous parallel lines, no discal spot. Very distinct, though the shape and marking recall the following group. Variable, sometimes with darkened median area. Antennal ciliation in ♂ nearly as long as diameter of shaft. Samarkand, Issyk-kul, etc. *assectata.*

E. extensaria Frr. (= *prolongata* Zell.) (13 g). A rather large, long-winged species, the ♀ with much more robust body and smaller wings than the ♂. Characterized by its alternations of white ground-colour and brown-grey bands, parallel with one another and with the distal margin. ♂ antennal ciliation moderate, not so long as the diameter of the shaft. Very variable, the name-type not very sharply marked, described from Kasan and again by ZELLER from Livonia. This form occurs chiefly in Eastern Europe, but also (more or less mixed with *sydyi* or *leuca*) in some parts of Western and Central Asia. — **sydyi** Stgr., from the Ili district, the Altai, etc., is more silver-grey, more sharply marked. — **occidua** nom. nov. (= *prolongata* Dietze nec Zell.) (13 o) from England (Norfolk and Yorkshire coasts) is still more sharply marked, the brown bands often darker, nearly always marked with interrupted black lines, or dots or dashes on the veins. — **leuca** Dietze, from the Ili and Ussuri districts, is yellowish white with the bands only quite weakly marked. — Larva on flowers and seeds of *Artemisia maritima*, wonderfully protected when coiled up among these. The pupa hibernates. Imago in May—June. *extensaria.* *sydyi.* *occidua.* *leuca.*

E. rebeli Bohatsch is said to be near *extensaria*, palpus still shorter, forewing more pointed, whitish tinged with brown, costal margin broadly brownish grey, numerous slender brown lines, a white band before the distal margin, sending a branch into the apex, hindwing light brown-grey, with a dentate double white band. Zerafshan, Ferghana, Issyk-kul and Ili. *rebeli.*

E. furcata Stgr. Shape nearly as in *extensaria*, smaller, darker; grey, the white markings indistinct except a white subterminal band which broadens anteriorly and is forked before reaching the costa, the more slender branch running into the apex, the broader into the hindmargin near it. Central and N. E. Asia Minor. *furcata.*

E. aegyptiaca Dietze is a small and rather narrow-winged form from Cairo which has not yet been adequately made known. "Perhaps related to *furcata*" but without the characteristic forked pale band of that species. *aegyptiaca.*

E. hyperboreata Stgr. Near *nanata*, but differing in the ♂ genitalia. Ground-colour more uniform violet-brown, the whitish bands and apical streak of the forewing reduced, the lines which bound the median area on the other hand often sharply expressed, perhaps not quite so acutely angulated as in *nanata*. Hindwing quite weakly marked. — ab. **transversa** Dietze is more extreme in the dissolution of the fine dark and light lines, but a light band remains between the median band and distal area. — Larva on *Ledum palustre*. Moth in June—July. N. to N. E. Europe and reaching southward to Berlin. *hyperboreata.* *transversa.*

E. nanata Hbn. (12k). Somewhat recalls *extensaria* in colouring but is much smaller, generally less sharply marked, the markings rather less oblique, the subterminal much less straight, discal dots present. White streak from apex rather strong, obliquely intersecting the subterminal. — **pauillaria** Bsd. is a small dark second-brood form, occurring in its most extreme development in the South of France. — **gelidata** Möschl., from Labrador and Greenland (according to STAUDINGER also the Shetland Islands) has the forewing darkened but with distinct ash-coloured bands, particularly the one distally to the median area. — Larva on *Calluna vulgaris*, sometimes on *Erica carnea*. Flies in May and again in August. Common and widely distributed in Europe. *nanata.* *pauillaria.* *gelidata.*

E. innotata Hufn. (12l). DIETZE has a very full, interesting and important discussion of this species, which is much too long even to summarize here; and concludes that there is at present absolutely no evidence for the specific separation of *fraxinata* or *tamarisciata*. In England, where the *fraxinata* form is single brooded, widely distributed and constant in its specialization to ash, while *innotata* is extremely local and scarce, it is probably in process of differentiation, but DIETZE has shown conclusively that the larval differences, on which CREWE chiefly relied, are valueless for this purpose, being alterable with altered diet. *innotata* is very variable, though perhaps the naming of varieties has been carried too far. The well-known name-type is the rather large, not very dark European and West Asiatic form which can be bred in profusion in April—May from *Artemisia larvae* (especially *A. campestris*). — **fraxinata** Crewe (= *meridionalis* Mab.) (12l) is generally smaller *innotata.* *fraxinata.*

and darker, the larva feeding on leaves of ash (England and the Middle Rhine) or also on blackthorn, white-thorn, rose, etc. In warm localities it occurs as the summer generation of *innotata*, August-October. — *suspectata* Dietze is a still smaller summer-brood form from the Middle Rhine, bred from more delicately built, blackthorn-feeding larvae. — *tamarisciata* Frr. (121), single-brooded at Tegernsee (Bavaria), a summer form of *innotata* in other southern localities, is the product of a variegated green, white-mixed larva which feeds on *Myricaria germanica* and *Tamarix gallica*. The moth is generally larger than *fraxinata*, more leaden-grey than *innotata*. — *grisescens* Petersen is a bluish-grey, scarcely brown-mixed form from Esthonia and probably East Prussia, Uralsk, etc. — *perturbatrix* Dietze is a pale sand-coloured, weakly marked form from the desert region of Korla, Central Asia. — *uliata* Stgr., from the Uliassutai district, was founded on two worn, strongly blackened ♀♀. — *corroborata* Dietze, from Ili, Issyk-kul, etc., has the transverse markings strongly blackish. — *omniparens* Dietze is a strikingly large grey form from many localities in Central Asia (Zerafshan, Issyk-kul, etc.) approaching f. *parallelaria*. — *paupera* Dietze has the ground-colour blackish, the markings almost wanting. Ili and Ferghana, transitional to the following. — *praesignata* Bohatsch, perhaps a separate species, is said to be larger and at the same time more delicately built and more weakly scaled than *tamarisciata*, palpus small and short. Fringes apparently longer and softer than in *innotata*. Trans-Alai. — *parallelaria* Bohatsch. Mostly larger and lighter than *innotata*, the ♂ approaching *unedonata*. BOHATSCH described it as a large, light, more distinctly marked race of that species. Distributed in Central Asia and especially Mongolia.

unedonata. *E. unedonata* Mab. (13i). Near *innotata*, the forewing generally more acute, more cinereous, the lines straighter, less broken up into spots, the subterminal as a rule less distinct, discal spot more slender. As with *innotata*, the name-type represents the large spring-brood form. — *autumnalis* Dietze, the second-brood form, is essentially smaller and corresponds approximately to *innotata* f. *fraxinata*. — Larva on the blossom of *Arbutus unedo* in October–December, also in Tunis on *Rhus dioca*; food-plant of the summer generation unknown. Moth in March and again about October, often taken at light. Distributed in the Mediterranean countries. — *hybrida* Dietze is the result of crossing this species with *innotata*, which is apparently not difficult to accomplish if *unedonata* is prevented by artificial cooling from emerging too early. Both crossings were obtained, so that another name is really required; the larvae and moths generally inclined to follow those of the ♀ parent.

costisignata. *E. costisignata* Dietze (= ? *famelica* Dietze) was originally regarded as a form of *unedonata*, but the genitalia prove it to be a distinct species. Nearly always distinguishable by the black costal spots, though these vary much in size. The palpus appears shorter than in *innotata*. The name-typical form is light ash-grey. Korla and Yarkand. — *relaxata* Dietze is a large form from Schahkuh, Persia, sometimes (but not always) without the costal thickening of the lines. — *infumata* Dietze, from Naryn, Turkestan, is a dark, smoky form. — *privata* Dietze (? spec. div.) is more weakly marked, with oblique double lines from the middle of the forewing to the hindmargin, there not essentially thickened. Transcaspia. — *vicariata* Dietze differs from the preceding in that the proximal of the two middle lines gradually thickens towards the hindmargin, suggesting a transition between *unedonata* and *phoeniceata*. Zerafshan, 2500 m, in July. — *decipiens* (Petersen) Dietze is similar to *vicariata*, but shows a dark distal boundary to the median area of the forewing and a distinct discal dot on the hindwing. Schahkuh. — *adjunctata* Dietze. More yellowish than *vicariata*. Border of both wings interruptedly black. Korla. Is likely to prove a separate species. — *mitigata* Dietze pale yellowish grey, quite weakly marked, the lines more rounded near costa. As the wings appear somewhat broader and the palpus somewhat shorter this may also be a separate species. Lob-nor.

novata. *E. novata* Dietze. Position doubtful; in habitus recalling *innotata*. The peculiar elongate forewing, less elongate hindwing and short body are said to be characteristic. Iron-grey, tinged with violet-bluish, scheme of markings as in *gemellata*, the coarse, rough scaling more as in *santolinata*. Zeitun, Taurus.

virgaureata. *E. virgaureata* Dbld. (= *offirmata* Greutzb., *pimpinellata* Guen. nec Hbn.) (12f). Superficially similar to *castigata* but with ♂ antennal ciliation long, costal margin somewhat more rounded, colour generally somewhat more yellowish grey, etc. Very variable. — *aestiva* Dietze, the summer generation, is considerably smaller. — *altenaria* Stgr. is a very weakly marked, sometimes almost unicolorous form from Finmark, Lapland and Transbaikal. — The June larvae feed on whitethorn, blackthorn, etc., the autumn brood on the flowers of various Compositae, etc., preferring *Solidago* and *Senecio*. North and Central Europe and across Siberia to Japan.

detritata. *E. detritata* Stgr. is said to have thinly scaled, dirty grey wings and black discal dot, resembling *altenaria*, but narrower-winged almost as *innotata*. Ussuri district.

lentiscata. *E. lentiscata* Mab. (13i). Perhaps somewhat related to *virgaureata*. Brownish grey, the dark markings indistinct, strongest costally, marked with spots on the veins; 3 parallel lines between basal and median area

the most distinct; subterminal line chiefly conspicuous as a double spot at anal angle. Underside paler. Antennal ciliation strong but shorter than in *virgaureata*. Larva on the flowers of *Pistacia lentiscus*. The pupa hibernates. Only known from Corsica.

E. abbreviata Steph. (= *nebulata* Haw., nec Scop., *guinardaria* H.-Sch.) (12l). Forewing elongate, hindwing small, with distal margin almost straight from near apex to behind middle. Forewing with a decided tinge of ochreous, strong dark vein-dashes proximally to postmedian line, those on the median veins especially well developed. Antennal ciliation not very long. — **hirschkei** Bastelb., prevalent in the Middle Rhine district, is more weakly marked. — Larva in May—June on oak. Imago in March—April in Central and Southern Europe and Transcaucasia. *abbreviata.*
hirschkei.

E. proterva Btlr. (= *subbreviata* Stgr.) (13i). Narrower winged, median area narrower and more darkened. May superficially be compared with *lanceata*, similar in size and colour, almost as narrow, hindwing shaped more as in *abbreviata*. ♂ antennal ciliation almost as long as diameter of shaft. Japan, Korea and Askold, probably also on the Ussuri River. *proterva.*

E. dodoneata Guen. (12l). Smaller than *abbreviata*, more normally shaped, less ochreous, more sharply marked, especially the hindwing. — **quercifoliata** B.-Haas, from S. Scandinavia and N. Germany, is larger and much paler, at least in the median area of forewing and basal part of hindwing. — **meridionalis** Mab., from Corsica and S. Europe, is in general smaller and more brightly coloured. — Larva on oak and hawthorn in June or early July. Moth about May. Widely distributed in the Mediterranean countries, becoming more local further north. *dodoneata.*
quercifoliata.
meridionalis.

E. cocciferata Mill. (= *semitinctaria* Mab.) is very like *abbreviata* but rather broader-winged, darker, more coarsely scaled, the dashes on the veins less distinct, discal dot perhaps rounder. Antennal ciliation longer, about equal to the diameter of the shaft. Larva on *Quercus coccifera*, *suber*, *ilex*, etc. Moth in spring, in the Mediterranean countries. *cocciferata.*

E. tenerifensis Rbl. Larger and still broader than *cocciferata*, ♂ antennal ciliation still longer, each segment bearing laterally a pair of bristles almost twice diameter of shaft; cell-spot much larger and thicker, light interior of median area broader, fold and 2nd median strongly blackened from the middle of the wing. Hindwing somewhat longer. Underside, as also of the body, more whitish; cell-spot larger, postmedian line further removed from it. Guimar, Tenerife. *tenerifensis.*

E. massiliata Mill. (13i). A small species, dark earth-grey, all the markings indistinct, with a dusting of light and dark scales. Discal dot small and roundish, not elongate as in *ultimaria*. Subterminal line discernible, somewhat enlarged at anal angle. Antennal ciliation short. Larva in May and June on evergreen oaks. Moth in the spring, in various localities on and near the Mediterranean. *massiliata.*

E. boryata Rbl. Wings longer and narrower than in *massiliata*, ♂ antennal ciliation much longer, exceeding diameter of shaft. Palpus considerably longer, rougher scaled. Markings the same, but the outer light stripe more angled near costa. Canaries. *boryata.*

E. ultimaria Bsd. (12k). Easily known by its shape and markings. Distinctive are the elongate discal marks and especially the strongly curved pale postmedian band of the forewing. Antennal ciliation short and close. Larva on the flowers and leaves of *Tamarix gallica*. — **minuscule** Alph. is more grey in colour but otherwise differs little. Ili, Syr-Daria and S. Ural. — **opisthographata** Dietze. Upperside almost bone-colour; underside pure white with the distal half of both wings mostly black. Aksu, Mongolia. Also recorded from Herzegovina. *ultimaria.*
minuscule.
opisthographata.

E. tenellata Dietze superficially resembles *ultimaria* but is remarkable for having a protuberant swelling on the frons. Earth grey with elongate cell-mark and sharply expressed lines, the postmedian formed about as in the *venosata* group. Underside more weakly marked. Tunis and S. Algeria. *tenellata.*

E. graciliata Dietze. Frons as in the preceding. A small, whitish, *Acidalia*-like species, the forewing with small crescentic discal mark, the lines few and very slender but distinct, blackish; a slight clay-coloured admixture proximally and distally to the median area, which is not darkened. Kuschk on the Russian-Afghan frontier. *graciliata.*

E. tornifascia Rthschd. "Differs from *tenellata* at first sight in that the curved double postdiscal bands on forewing run down to inner margin almost at tornus instead of curving in and almost joining it together *tornifascia.*

with the median bands. The black marks on costa are larger and wider apart. Length of a forewing 9.5 mm". A ♀ between Ouargla and El-Golea, S. Algeria.

- arenicola.* **E. arenicola** *Rthschd.* "Differs from *tenellata* by its sandy buff ground colour, in the parallel transverse lines on both wings being straighter, but much more crenulated, and the distinct dark stigma in both wings. Length of a forewing ♂ 8.5, ♀ 8–10 mm". S. Algeria: half-way between Ouargla and El-Golea and South Oued Mya.
- sobrinata.* **E. sobrinata** *Hbn.* (? = *pusillata* *Schiff.*) (121). Extremely variable but generally easy to recognize by the acutely angulated antemedian line, whitish patch between discal dot and postmedian, dark dashes proximally to the postmedian, etc. Antennal ciliation short. — *graeseriata* *Rätzer* (= *latoniata* *Mill.*) is larger and greyer, in general more weakly marked but very variable. Swiss Alps. — *anglicata* *H.-Sch.* (= *stevensata* *Webb*), from the chalk cliffs of Kent, is a whitish grey form of rather characteristic appearance. — *scoriata* *Stgr.*, from Iceland, is a dark, weakly-marked form. — Larva on *Juniperus communis*, that of *graeseriata* also on *J. nana*. It forms in the egg-shell in the autumn, hatching in the spring. Imago in August in early September. Widely distributed in North and Central Europe, more local in the South.
- corticosa.* **E. corticosa** *nom. nov.* (= *draudti* *Dietze*, *nom. praeocc.*). Rather uniform bark-colour with a slight cupreous tinge, markings scarcely indicated, median area slightly darkened, proximal half of marginal area a little lighter; cell-spot small, oval, deep black, bordered by some light scales as in *sobrinata*. Under surface glossy, a little paler, discal dots smaller, median area of forewing continued on the costal margin distally by a blackish spot; distal margin with a blackish spot; distal margin dark, interrupted. Fringes long, not distinctly chequered. Cilia of ♂ less than diameter of shaft. Palpus unusually long, about 2½ times diameter of eye. Tokio in April.
- ericeata.* **E. ericeata** *Rbr.* (= *millierata* *Stgr.*) (121). Very similar to not very variegated forms of *sobrinata*, the discal dot smaller, the antemedian and median lines more widely diverging posteriorly. ♂ antennal ciliation short. Larva in the early spring on *Erica arborea* or *Juniperus*. Imago in September–October, local in S. Europe and N. Africa.
- oxycedrata.* **E. oxycedrata** *Rbr.* (= *provinciata* *Mill.*) (121). Narrower-winged than the 3 preceding, the lines fine, the antemedian and median still more widely diverging; the black wedge-markings on the veins strong. Larva on *Juniperus oxycedrus*. *oxycedrata* inhabits the Mediterranean lands; spring and autumn.
- phoeniceata.* **E. phoeniceata** *Rbr.* (121) is again similar, the angle formed by antemedian and median lines narrower; characterized by the extremely oblique lines, which make the wing appear narrower than it really is. Hindwing weakly marked. Antenna in ♂ well ciliated, the cilia not quite as long as the diameter of the shaft. — *mnemosynata* *Mill.* is a larger form, chiefly obtained from cypress in gardens. Otherwise *phoeniceata* lives chiefly on juniper, December and January. Moth in September and October, in the Mediterranean region.
- adscriptaria.* **E. adscriptaria** *Stgr.* Ground-colour duller and more uniform than in *oxycedrata*, the markings reduced, only the discal spot, the dark angulated markings to the inner margin and the wedge-shaped markings towards the apex developed. Asia Minor to Transcaucasia.
- euxinata.* **E. euxinata** *Bohatsch* is much darker than *oxycedrata*, according to *STAUDINGER* scarcely distinguishable from *adscriptaria*, but *DIETZE* says that the ♂ antenna is serrate, with loose ciliation. Amasia; Crimea.
- sardoa.* **E. sardoa** *Dietze*. Size and colour nearly as in *euxinata*. The lines which, in *oxycedrata*, form the conspicuous angle posteriorly are almost wanting, instead there is a rather oblique dark indication of the proximal and distal boundaries of median area. Discal spot more or less distinct; nervures more darkened within than outside the median area. But chiefly distinguished by the ♂ antenna, which is strongly dentate with strongly developed ciliation. Sardinia.
- ros-marinata.* **E. rosmarinata** *Mill.* (130). Wings elongate, fringes very long. Grey with a slight violet tinge. The lines are sharply angled anteriorly, then pretty straight and extremely oblique, those at the beginning of the distal area forming a sort of slender W-markings near the apex. ♂ antennal ciliation longer than diameter of shaft. Palpus narrow and pointed. Larva in March on *Rosmarinus officinalis*. Moth in November–December. Spain, S. France and Tunis.
- lariciata.* **E. lariciata** *Frr.* (= ? *residuata* *Hbn.*) (12g) much resembles some dark forms of *castigata* but is rather longer-winged, the lines on an average sharper, the proximal ones rather more acutely angled. Best distinguished by a white metathoracic spot. Larva on larch in July–August, eating the needles. The pupa hibernates, the moth appearing in May–June. Central and Northern Europe, Transcaucasia to Transbaikal.

E. lavicata *Fuchs* is said to resemble *lariciata* in the postmedian line but is quite doubtful, the lines being almost obliterated. Long-winged, forewing uniform smoky brown-grey, with sharply black discal streak, hindwing rather less dark, a broken band before distal margin. Norway: Lavik.

E. emanata *Dietze* (= *korbi* *Dietze*, *sordidata* *Wileman*) has about the colour of the lightest, most reddish-grey *lariciata*, but is larger (at least in Japan), the antennal ciliation rather longer, the hindwing approaching the *abbreviata* shape. Median vein of forewing light yellow-brown, with black longitudinal dashes, 3rd radial and 1st median clear yellow-brown; only the principal lines are strong, antemedian blackest anteriorly, sharply angled, followed by dark dashes on the veins, median deeply incurved behind the elongate black cell-spot, postmedian making a wider bend outwards than in *lariciata*. Hindwing and underside paler, with cell-spot and postmedian line. Japan: Yezo, in June. Also Amur and Ussuri.

E. atrisignis *Btlr.* (13k), Darker than *lariciata*, forewing somewhat less elongate, more glossy, discal spots much larger, etc. Larva rather slender, gold-yellow, with slender dark dorsal line. On *Cedrus deodarus*, at 2000 m elevation. Bred in June by Lord WALSHINGHAM. Dharmasala.

E. tantillaria *Bsd.* (= *subumbrata* *Hbn.* nec *Schiff.*, *pusillata* *Hbn.* nec *Schiff.*) Generally recognizable by the very large discal spots, strong but not numerous lines, generally interrupted band before the subterminal line, strongly bent postmedian line of hindwing, etc. Antennal ciliation short and close. The name-type is a dark form from S. Europe, rarer in Germany. — **piceata** *form. nov.* (= *subumbrata* *Dietze*) (13o) has lighter ground-colour, sometimes showing a tinge of greenish or reddish. Prevails in North and Central Europe, apparently also in the Caucasus. — **calabrica** *Dietze* is a larger, more strongly built greyish form from Calabria. — Larva on *Picea excelsa*, in some localities also on *Larix*, eating the needles; full-grown about July. The pupa hibernates. Moth in May, in the mountains later.

E. conterminata *Zell.* (= *manniaria* *H.-Schäff.*) (13k). A small species, the cell-spot of the forewing as thick as in the preceding and often relatively even longer, some large black costal spots, that beyond the cell-spot followed immediately by a whitish one, the lines weak. The larva has been bred from the egg on spruce. Imago in May and early June, Germany to Finland, very local.

E. daemionata *Dietze*. Size and shape of *insignata* (12e), markings recalling *lanceata* (13o). Whitish, with brownish, black-margined median area on the forewing and large deep black discal lunule. Distal half of marginal area darkened, showing an interrupted subterminal line. Nikko, Japan.

E. lanceata *Hbn.* (= *hospitata* *Tr.*) (13o) may be known at once by the extraordinarily long and oblique distal margin and by the course of the lines, the antemedian being very acutely angulated, the postmedian touching the discal mark and then running almost in the direction of the anal angle. Larva on *Picea excelsa* in May—June. Imago in April. Distributed in Northern and Central Europe.

E. conjunctiva *Hmps.*, founded on a single rather worn specimen, is slightly more reddish tinged than *lanceata*, the inner line and discal mark similar, postmedian line sharply angled at the 3rd radial, connected with antemedian by a black line along the fold. Dharmasala.

E. nobilitata *Stgr.* (= *medionotata* *Warr.*) (13a) is according to BOHATSCH related to *lanceata*. Large, with long glossy fringes. Said to be very variable, so that the descriptions based on single specimens are of little value and I have no material before me. STAUDINGER's type was blackish grey, the forewing with longitudinal dull chocolate-brown band at the base and in the middle, a wisp of the same colour towards the apex, etc. WARREN's specimen was more ochreous grey, the central stripe paler, crossed by white and blackish transverse lines. Ala Tau and Koko-Nor.

E. chesiata *Dietze* (13a). Near *nobilitata*, lighter more clay-coloured (with red-brown admixture), the lines more curved behind the cell. Wings (especially in the ♀) strikingly long and narrow, somewhat recalling *Chesias*. Central Asia: Korla, Sai-chin, Aksu.

E. elimata *Dietze* (= *sebdovens* *Dietze*) is said to differ from all other Palearctic *Eupithecia* in its robust build, very dense scaling, large eye, long palpus; etc., resembling some exotic species. Forewing dark smoky brown with violet suffusion and with numerous sharply angled lighter and darker zigzag lines and bands; median area darker, divided in the centre by two white lines; discal mark elongate. Hindwing uniform dark sepia brown. Sebdou, Oran. The figure somewhat recalls the group of *hormiga* *Dogn.*, from S. America.

74. Genus: **Gymnoscelis** Mab.

Characters of *Eupithecia*, but with the median spurs of the hindtibia entirely wanting or quite rudimentary. Life-history similar to that of *Eupithecia*.

This genus is chiefly Indo-Australian, though represented also in the Palearctic Region and N. America.

pumilata. **G. pumilata** Hbn. (= *bistrigata* Haw., *recictaria* Bsd., *improbata* Zell., *pauzellaria* H.-Schäff.) (12 m). Very variable but easily known by the form of the markings and generally by the reddish bands, sharply marked hindwing with wedge-shaped markings line etc. The name-typical form is brightly coloured. — *parvularia* H.-*tempestivata* Schäff. (gen. aest.?) is a small form perhaps resulting from quick growth and dry innutritious food. — *tempestivata* Zell. (= *globulariata* Mill., *incertata* Mill.) is a greyer, less red-marked form. S. France, Andalusia, Sicily, *insulariata*. Algeria. etc. — *insulariata* Staint., from Madeira and the Canaries, is generally darker, postmedian line of both wings more dentate, in bent between radials. Variable, often large. — *postgenitata* Dietze has the basal area of both wings darkened, the median area remaining whitish. Osch (Turkestan) and Syr Daria. — Larva polyphagous and extremely variable, in a succession of broods. Widely distributed in Europe, N. Africa to Egypt, West and Central Asia, in the warmest localities chiefly in the form *tempestivata*.

bicoloria. **G. bicoloria** B.-Bak. is unknown to me. 16 mm. Forewing silver-grey, basal area dark grey, edged by a darker curved line; a dark curved postmedian line, distally to which the whole surface is densely irrorated with blackish; posteriorly this irroration encroaches on the median area of the wing; subterminal line obsolescent. Hindwing grey, distally dark dusted, with interrupted pale subterminal line. Madeira, one example, taken high up, about the fir-tree limit.

dearmata. **G. dearmata** Dietze. Very small, earth-grey, without gloss, with numerous ill-defined transverse lines consisting of dark scales; the most distinct is the postmedian, especially its anterior angles; this does not, as in *pumilata*, start almost vertically on the costa, but obliquely outwards, leaving basewards an angle of about 125°. Hindwing relatively smaller than in *pumilata*, quite weakly marked. Mesopotamia: Mardin.

75. Genus: **Chloroclystis** Hbn.

Characters nearly as in *Eupithecia*, areole always simple, more or less broad, the 1st subcostal vein running into the costal. Early stages similar to those of *Eupithecia*.

Like the preceding, this genus is chiefly Indo-Australian but it straggles into the Palearctic and Aethiopian Regions. The type species, *coronata* Hbn., is somewhat isolated from all others in shape, resting posture, pattern, genitalia, etc. and DIETZE removes all the rest to a new genus, *Calliclystis*. The species are very commonly of a green colour.

coronata. **C. coronata** Hbn. (= *vata* Haw., *lucinda* Btlr.) (13k) is distinguished at once by the broad forewing and its V-shaped black costal mark (anterior half of postmedian line). Larva in two generations on Clematis, Eupatorium, Solidago, Angelica, Crataegus, Rubus and occasionally on various other plants, eating chiefly the flowers and fruit. Moth in April–May and in July, stragglers also emerging in September or later; usually hibernates fully developed in the pupal shell. Widely distributed in Central and Southern Europe, Transcaucasia, N. Persia, Dzhirgatala, Ussuri and at Yokohama.

chloërata. **C. chloërata** Mab. (13k). Very similar to *rectangulata* but easily known by having the first abdominal segment dorsally tinged with reddish. Less variable, usually greyer, postmedian line less strongly angled anteriorly, more broken up into dots. — *hadenata* Fuchs is a darker, almost markingless form. — Larva spun up in blossom of *Prunus spinosa*. Moth in May, Central France to Galicia, reported also from Russia to Transbaikal and from N. Japan.

consueta. **N. consueta** Btlr. Extremely like the greyest, most copiously lined forms of *debiliata* (13k), sometimes darker; postmedian line stronger, the black vein-dots therefore less noticeable; on the forewing this line curves somewhat basewards at the costa (in *debiliata* faintly outwards, though less so than in *rectangulata*). Under surface about as in *debiliata*, of which it may be the Japanese form. Ovipositor in ♀ well developed.

subcinctata. **C. subcinctata** sp. nov. It is scarcely possible that this is a form of *consueta*, in spite of very close resemblance. Ground-colour somewhat more whitish, the strong postmedian line projecting at the radials,

nearly as in *rectangulata*, but costally with at least as strong a proximal curve as in *consueta*; subterminal line less dentate, on underside thickened, not dentate; discal dots larger, especially on forewing. Underside nearly white, sharply marked, the postmedian line even thicker than in *debiliata* and *consueta*, an equally dark band present proximally to the subterminal. ♀ ovipositor rather long. Gensan, Korea, July; type in coll. Brit. Mus. Nikko, in coll. PÜNGELER.

C. rectangulata L. (= *viridulata* Hufn., *mediana* Panz.) (13k). Green, more or less dulled with black, the lines black, the postmedian forming sharper angles than in the two following. Underside very sharply marked. — In ab. *subaerata* Hbn. the black markings are reduced, only the antemedian and the postmedian line developed. — In ab. *cydoniata* Bkh. the black is increased, particularly in the median area. — ab. *nigrosericeata* Haw. (= *sericeata* Haw., *bischoffaria* Hbn., *anthrax* Dietze) is entirely or almost entirely black. About London this form has almost entirely supplanted the others. — The larva feeds in the blossom of wild and cultivated apple and is often very injurious. It grows rapidly and produces the perfect insect at the end of May or in June. The egg hibernates. Widely distributed and often abundant in Europe. Also in Transcaucasia. — *griseata* Stgr., cited by its author as a form of *debiliata* or possibly of *chloërata*, is according to DIETZE a grey form of *rectangulata*. Ussuri. Perhaps it will prove to be referable to *consueta*.

C. debiliata Hbn. (13k). Much paler than the two preceding, being of a very delicate, evanescent pale green, the lines mostly much weaker, strongest on the veins. — ab. *nigropunctata* Chant. has only the principal lines, these being marked as strong vein-dots. Frequent in Devonshire. — *grisescens* Dietze is silvery grey without a tinge of green. Recorded by SPEISER, from *Vaccinium uliginosum* on the Prussian moors, as *griseata* Stgr. — Larva on *Vaccinium myrtillus*, feeding spun up in terminal shoots in the spring. Moth in June—July. Central Europe to the Ural and Transcaucasia.

C. agitata Chr. (13k). Unknown to me, doubtfully referable to this genus; DIETZE thinks it probably a *Collix*. It differs from *debiliata* in its reddish-grey colour, strong black-brown costal streaks and spots, obsolete lines and crenulate white subterminal; median area bounded by fine vein-dots. Distal margin of hindwing weakly crenulate. Antenna in ♂ without ciliation. Palpus shortish. Amur and Ussuri district.

76. Genus: **Cithecia** Stgr.

An offshoot (perhaps merely a section, as HAMPSON and PÜNGELER regard it) of *Chloroclystis*, with long pointed frontal tuft and very long palpus (about 3 times diameter of eye); 2nd palpal joint greatly prolonged, with long projecting scales beneath, 3rd joint moderate, slender, slightly deflexed, partly concealed. ♂ antennal ciliation minute.

All the forms which seem strictly referable here are treated by HAMPSON as a single species, *palpata* Walk., but they will perhaps need careful revision. They are distributed from India to Java and Japan.

Ziridava Wkr. scarcely differs except in ♂ antenna and in shape and facies, and would be the oldest name for the genus.

C. excisa Btlr. (= *julia* Btlr., *macrocheila* Stgr.) (13l). Superficially similar to the banded forms of *rectangulata*, the median area solid, brown or blackish, the green colour restricted to the narrow pale bands which bound this area; discal dot large. Hindwing weakly marked or markingless. Only differs from the variable Indian *palpata* in having in general less green colouring, a larger discal dot and darker hindwing. Japan and the Ussuri district. From Dharmasala I have before me somewhat intermediate forms.

77. Genus: **Collix** Guen.

Akin to *Eupithecia*, differing in the strongly dentate distal margin of the hindwing and from most species of *Eupithecia* in the double areole. It probably intergrades with *Horisme*, or at least Section B (*Pseudocollix*) might well be transferred to that genus.

Early stages insufficiently known.

The genus is chiefly Indo-Australian, with very few Palearctic and African representatives.

A. Palpus long. Forewing with tuft of raised scales on discocellulars. (*Collix*)

C. hyospilata Guen. (13n). Purplish fuscous, the lines quite indistinct, the pale postmedian band *hyospilata*, somewhat better indicated, at least anteriorly, the subterminal represented by whitish dots; cell-spot of fore-

wing large and roundish. Both wings beneath lighter, with large black cell-spot, curved fuscous postmedian stripe and subterminal row of black internervular spots, that between the 3rd radial and 1st median usually wanting. A S. Indian species, but recorded from Japan by WILEMAN.

B. Palpus less elongate. Cell-spot not appreciably raised (*Pseudocollix* Warr.).

- sparsata.* **C. sparsata** Tr. (= *sparsaria* Hbn., [nom. praeocc.], *melanoparia* Grasl.) (130). Smaller and more *Eupithecia*-like than the other species, upperside weakly marked except at costa, cell-spots small, the veins, especially in distal area, alternately black and white dotted. Underside paler, especially of hindwing; both wings with large cell-spot and distinct postmedian line, angulated in the middle. Egg oval, somewhat flattened, pale green. Larva elongate, light green with indistinct pale longitudinal lines and yellow lateral stripe. It feeds in August on *Lysimachia vulgaris*. The pupa hibernates, the moth appearing in June. Local; Central Europe, Ussuri district and Japan.
- flavovenata.* **C. flavovenata** Leech. The unique type (♀) has lost its head, but no doubt belongs here. Forewing more pointed than in *sparsata*, hindwing even more deeply dentate. Apart from the darker, less dotted upperside, with slender cell-mark, quite different postmedian line, etc., *flavovenata* may be at once distinguished by having the veins beneath broadly yellow ochreous. Ta-chien-lu.
- minuta.* **C. minuta** Btlr. Distal margin of hindwing so weakly crenulate that at first sight it appears like a *Eupithecia*. I have only seen worn specimens but it is very distinct in the very broad median area, the curved, denticulate-edged whitish outer band being placed unusually near the distal margin, and especially by the remarkable underside, which is white, the forewing and costal margin of hindwing with the veins very broadly ochreous, both wings with curved fuscous postmedian and terminal bands, the latter (at least on the forewing) forked anteriorly. Japan: Yokohama.
- macularia.* **C. macularia** Leech (11c), described as a *Phibalapteryx*, seems referable here. Face smoother. Very distinct in pattern, especially characterized by the large costal and submarginal spots of the forewing. Under surface pale brown, in part suffused and clouded with fuscous, not so sharply marked as in the other species. Founded on a single ♂ (not ♀) taken at Omei-shan, W. China, in July.

78. Genus: **Coenocalpe** Hbn.

Very different in shape from *Eupithecia* and *Collix*, (more recalling *Zola*), the hindwing elongate costally, its distal margin somewhat sinuous and waved but not dentate. General characters of *Horisme*, but the discocellulars of the hindwing biangulate, the abdominal crests so slightly developed that MEYRICK has not separated the species from the *Cidaria* group.

Only one species known, exclusively Palearctic.

- lapidata.* **C. lapidata** Hbn. (= *subrufata* Haw., *curata* Ev.) (131). Cannot possibly be confused with any other species. Lines fine, discal dots minute or wanting, apex of forewing with an oblique shade as in *Horisme*.
- millierata.* The name-typical form is pale. — **millierata** Stgr., from S. E. France, is more liver-coloured, more obscurely marked, the hindwing more darkened distally. — The egg hibernates. The larva has been reared on Clematis, but possibly feeds in a wild state on *Thalictrum*; nearly cylindrical, dorsally with longitudinal lines and stripes of ochreous and brown or fuscous, ventrally more reddish, lateral stripe pale, tubercles and spiracles black. Pupa cylindrical, rather blunt at ends, surface polished; reddish brown. *lapidata* is local in Central and N. Europe, N. Italy, the Altai and Changai Mountains and E. Siberia; chiefly a mountain species.

79. Genus: **Horisme** Hbn.

Characters of *Eupithecia*, areole double, metathorax generally crested, as well as abdomen, palpus strong but never very long, distal margin of hindwing slightly or moderately crenulate, never so irregular as in *Collix*.

The larvae are commonly attached to Clematis and have much in common with certain *Cidaria*, as *C. procellata*. The pupa hibernates.

A rather small but widely distributed genus, apparently wanting in South America. The early stages and the genitalia indicate that MEYRICK is wrong in uniting it with his *Eucymatoge* (= *Eupithecia* part.), notwithstanding that the imago shows many characters in common.

H. aquata *Hbn.* (131). Easily distinguished from the following by its smaller size, smoother scaling, *aquata*. paler coloration, straighter (not denticulate) lines of the median area, etc. — Larva variable, green, brownish or violaceous, dorsal line fine, blackish, white-edged, broken into spots on the middle segments, lateral stripe yellowish or flesh-coloured, black-edged above. On Clematis. The pupa hibernates. Imago in April—May and again in July. Distributed in Central Europe; has been reported from N. England (Cumberland), but this is doubtful.

H. vitalbata *Schiff.* (131). Very easily recognized by the strongly contrasted colouring and oblique *vitalbata*. arrangement of the dark fuscous or blackish central shade. Geographically variable. The name-typical form is distributed in Central and S. Europe, Asia Minor, etc. — **conspicua** *Hirschke* is on an average larger, and *conspicua*. is less brownish (more ashy or whitish). Local in the Styrian Alps. — **variegata** *Stgr.* is very similar to the *variegata*. preceding, the band very dark and broad on a pale ground-colour. Distributed in Central and Eastern Asia; also Dalmatia. — **detersata** *Püng.* is of normal size but has the ground-colour darker wood-brown, the dark *detersata*. band therefore not sharply contrasted. Ili district. Transitions occur in the Issyk-kul district and Ferghana. — Larva cylindrical, head somewhat flattened; grey-brown, the dark dorsal line broken on the 5 or 6 abdominal segments into an anterior black spot and posterior line which thickens in the middle; the other lines slender. On Clematis *vitalba* in two generations. Pupa rather stout, with fine sculpturing; blackish brown, lighter at the segment-incisions. Hibernates in an earthen cocoon. The moth flies in May—June and again in August.

H. falcata *B.-Haas.* Both wings more elongate, apex more acute, colour paler, markings ill-defined, *falcata* postmedian not appreciably projecting at 3rd radial, terminal line not broken into dots. Sajan district.

H. scorteata *Stgr.* is said to be somewhat similar to *vitalbata* (131), the forewing fuscous with base *scorteata*. and costal margin broadly leather-colour. My sole example is nearly unicolorous, the hindwing somewhat more crenulate than in *vitalbata*; possibly a different species. S. Andalusia and Algeria.

H. corticata *Tr.* (= *alutacearia* *Bsd.*) (131). Somewhat intermediate between the preceding and following *corticata*. groups. Forewing with costal region not pale, median area not darkened, but with sharp boundary-lines except anteriorly. Hindwing concolorous. Larva very similar to that of *tersata*, brownish grey, lighter posteriorly, the dark dorsal line broken into short thick streaks on the middle segments. On Clematis in two generations. Pupa dark brown, darker than that of *tersata*, the cremaster broader; hibernates. Imago in May and August, Italy, Austro-Hungary to Asia Minor, N. Syria and Transcaucasia.

H. parcata *Püng.* Near *tersata* (131) but smaller, forewing much less acute, hindwing even more *parcata*. strongly waved than in *corticata*. Greyer than *tersata*, nearer to the colour of *scotosiata*, which is larger and with more elongate forewing, etc. Markings not strong; discal dots obsolete. Koko-Nor. A browner, more pointedwinged form or ally from Kuldja.

H. tersata *Schiff.* (= *radicaria* *Lah.*) (131). Lines numerous but none very sharp, antemedian blackened *tersata*. at inner margin, postmedian with proximal teeth on the veins. Hindwing usually almost white costally, except in the distal area. The name-typical form, which is distributed from Europe (except the north) to Transcaucasia, has a yellow-brown hue. — gen. aest. **tersulata** *Stgr.* (= ? *singulariata* *Vill.*) is smaller, more *tersulata*. unicolorous, less sharply marked. — **testaceata** *Hbn.* is a greyer race, often sharply marked, known to me *testaceata*. from Zermatt and Hochschwab. — **tetricata** *Guen.* is more ash grey, without yellow tinge, the lines more *tetricata*. numerous but ill-defined. GUENÉE's types, from the Altai, showed other differences but the name is now applied comprehensively to the forms which eastward to Japan. — **chinensis** *Leech* is smaller and more reddish, *chinensis*. transverse lines weak, subterminal partly obliterated, some dark clouding on forewing proximally to the postmedian and proximally to the subterminal. Hindwing with the postmedian line straighter. Described from Chang Yang. I have a similar but rather darker example from Miyanoshta, Japan, end of August, presented by Dr. COCKAYNE. Possibly a separate species. — Larva cylindrical, with somewhat flattened head; ochreous brownish, the dark dorsal line broken up into spots or blotches on the first 5 or 6 abdominal segments. On Clematis *vitalba*. Pupa stout, deep red-brown, the wings with a greenish tinge. Hibernates in an earthen cocoon. Moth in May—June, with a partial second brood later.

H. intricata *Stgr.* This and the 3 following are unknown to me. Grey-black, forewing basally and *intricata*. distally somewhat brownish, without distinct lines, antemedian indicated at the margins, postmedian black, rather strongly dentate, subterminal obsolescent except as a triangular whitish spot near anal angle. Underside lighter than upper, but far darker than in *tersata*. Zaisan, 1 ♂, possibly a dark aberration of *tersata* though the postmedian line seems different.

- exoletata.* **H. exoletata** *H.-Schäff.* (= *exsoletaria H.-Schäff.*) (13 m). Smaller than *tersata*, forewing less acute. Fuscous, postmedian line forming a single cutward curve, subterminal bending strongly basewards behind the 2nd median vein and forming a large white spot towards anal angle; apex sharply divided. Antenna slightly thicker than in *tersata*. Sicily.
- lucillata.* **H. lucillata** *Guen.* Small and rather *Eupithecia*-like, apex obtuse for this genus. Wings silky, light grey, the lines waved, parallel, not sharply expressed; postmedian geminate, slightly dentate, followed by another line, then by a broad, rather darker distal area, subterminal obsolescent except at anal angle, where it forms a large white spot; veins distally to the postmedian dotted with white and black. Underside weakly marked. Altai and Changai Mountains.
- scotosiata.* **H. scotosiata** *Guen.* Forewing with apex acutely produced, subfalcate; hindwing with inner margin short, distal margin strongly dentate, the tooth at 2nd medial shorter. Dark grey with the lines fine, rather indistinct, subterminal forming rounded teeth, filled-in with blackish; discal dot small; a small black mark between the 3rd radial and 1st median. Hindwing with 2 black subterminal lines, between them a brownish tint, proximally some incomplete lines. Altai to Changai Mountains; ? Amurland.
- plurilineata.* **H. plurilineata** *Moore* (= *nigripunctata Warr.*, *nigrovittata Warr.*). Both wings rather long and narrow, forewing slightly, hindwing strongly crenulate. Rather variable, red-brown, the ♂ similarly marked to the *tersata* group, the postmedian thickened and blackened behind 3rd radial, the ♀ with blackish suffusions, assimilating superficially to those of *vitalbata*, or almost wholly fuscous. N. India, widely distributed.
- stratata.* **H. stratata** *Wilem.* Closely related to *plurilineata* and with similar, if somewhat less extreme, sexual dimorphism; perhaps a local form. Ground-colour paler, median area rather better defined, broader in middle, narrowing strongly at inner margin. The ♂ rather recalls *H. intestinata Guen.* Japan: Gokanoshō, Higo, September–October; Oiwake. Recorded by LEECH as *vitalbata* (!).
- aemulata.* **H. aemulata** *Hbn.* Similar to *tersata testaceata*, costal margin more arched distally, median band narrower, widening a little at hindmargin, scarcely projecting distally about the 3rd radial, antemedian line not blackened at hindmargin, apex not divided, veins distally to postmedian more sharply black-and-white dotted. Hindwing not white costally. — ab. **saorucki** *Schawerda* is blackish grey, almost without markings.
- saorucki.* — Larva similar to that of *tersata*, grey-green, the dark dorsal line broken into dashes on the middle segments, these dashes placed in light lozenge-shaped patches. On Clematis. Moth in June–July, local and generally rare, in the mountains from Switzerland to Bosnia. STAUDINGER adds "Urga (var. ?)".
- incurvaria.* **H. incurvaria** *Ersch.* is said to be related to the following but seems, from the figure, to be rather small and narrow-winged. Pale brownish fuscous, with numerous obscure lines, the postmedian lines angled near the costa, discal dot black, subterminal fine, waved, whitish, terminal broken into dots; hindwing with 2 divided whitish bands and a very distinct subterminal. Irkutsk in June.
- calligraphata.* **H. calligraphata** *H.-Schäff.* (= *taeniolata Ev.*, *ligaminata Ev.*) (25 i) may be known at once by its much more whitish ground-colour. Discal dots minute or obsolescent; the principal lines of the forewing somewhat accentuated at costal margin and on the veins. Larva stone-grey, less elongate than that of *tersata*, dorsal line only distinct anteriorly and posteriorly, broken into an irregular pattern of spots on the middle segments. On *Thalictrum foetidum*. Pupa shiny red-brown, similar to that of *tersata*; hibernating. Imago in June–July, in sheltered localities a partial 2nd brood. Local in the Southern Alps, Upper Styria, etc., and recorded from the S. Ural and Transcaucasia.
- milvaria.* **H. milvaria** *Chr.* Rather smaller than *calligraphata*, rather more brownish, the lines of the median area less broken up into vein-dots, the principal lines thickened at costa, the pale band beyond the median area moderately distinct, the line which follows it showing a characteristic, rather oblique dark costal streak; subterminal white line sometimes very conspicuous. Underside rather paler than in *calligraphata*, hindwing with less lines developed. Abdominal crests very slight. Ordubad. I describe from a pair from the Saján Mountains, determined by BANG-HAAS. Rather less yellow-brown than *incurvaria Ersch.*, distal area less straight-edged, subterminal line thicker, more deeply dentate; moreover *incurvaria* is said to show a dark discal mark.
- dentata.* **H. ? dentata** *D. Luc.* Wings rather elongate, forewing rosy grey, subbasal line curved, antemedian dentate, somewhat curved, discal dot distinct, postmedian dentate, distinct, somewhat curved basewards posteriorly, according to the figure accompanied proximally by a narrow grey shade, some less strong waved lines between the postmedian and the distal margin, apparently most distinct anteriorly. Hindwing concolorous, with a discal dot and 3 or 4 lines beyond it. Forewing beneath infuscated, especially between discal dot and base. Tarf, Algeria, in May. The figure, apparently not very good, shows a small, slenderly-built species not suggestive at a *Horisme*.

6. Subfamily: Geometrinae.

An enormous subfamily, or perhaps group of subfamilies, variously known as *Boarmiinae*, *Selidoseminae*, or *Ennominae*, but containing the typical genus *Phalaena-Geometra* Linn. Characterized by the partial or complete obsolescence of the 2nd radial vein of the hindwing put otherwise showing little or nothing in common. Hindwing nearly always fully spurred. Frenulum present. Forewing often with one vein wanting. The classification is exceedingly difficult and no existing system is at all satisfactory. It is impossible within the time and space at command to attempt any systematic revision here; indeed we can scarcely do more than provide an illustrated catalogue, following the order of STAUDINGER's with merely the correction of the most glaring errors and the addition of the many eastern forms and recent discoveries.

The eggs are sometimes very beautifully sculptured and those of *Ourapteryx* are remarkable for being true „upright eggs.“ The larvae are as diversified as the moths, in many of the groups humped and twiglike, in others quite smooth. Very many feed on trees or shrubs, but some of the groups (as *Gnophos*, the *Fidonia* group, etc.) chiefly or exclusively on low plants. The moths of the *Boarmia-Gnophos* group and some others rest with wings outspread on tree-trunks or rocks and are mostly well protected; other tree-feeders (*Selenia*, *Ennomos*, etc.) resemble withered leaves; a few mountain species (*Psodos*, etc.) and one or two others fly in the sunshine. The warning coloration of the *Abraxas* group has been mentioned in our Introduction, and its mimics under the *Larentiinae* (*Eucosmia*, *Callabraxas*, *Calleulype*, etc.)

The subfamily is distributed throughout the habitable world, though rather unequally, being far outnumbered in New Zealand by the *Larentiinae*. Some of the typical forms (*Braccinae* of WARREN) are gorgeously coloured with metallic blues and bright reds.

1. Genus: *Arichanna* Moore.

Face shortly rough-scaled. Palpus shortish or moderate, longescaled beneath. Wing-margins entire. Forewing usually with a fovea; 1st and 2nd subcostals separate, the former often anastomosing with costal.

Early stages insufficiently known.

A chiefly Indian genus, though numerous species just enter the Southeastern Palearctic Region. Only one species reaches Europe and this is absent from the west. They are large or moderate-sized moths, often with the habitus of *Abraxas*, though HAMPSON includes also species which scarcely differ from *Boarmia* except in the smooth wing margins.

A. Antenna in ♂ with fascicles of cilia (*Arichanna*).

A. marginata Warr. (14 a) may be known by the ocellated discal mark of the forewing, the course of the black postmedian line, which curves strongly inwards and becomes thicker behind the cell, and by the dark distal shading of the hindwing (sometimes more strongly developed than in our figure). It inhabits N. India and Formosa; Dharmasala is the only known Palearctic locality. *marginata*.

A. ramosa Walk. (14 a). Reconizable by the anteriorly bifurcate white median and postmedian bands of the forewing, the ochreous suffusion at the 3rd radial and 1st median, etc. Chang-Yang, Pu-tsu-fang and Tibet. Smaller and less sharply marked than Indian specimens. *ramosa*.

A. tetrica Btlr. (14 a) represents *ramosa* in Japan and differs in its stronger irroration and consequently more confused markings, weakly marked hindwing and under surface. The large discal spot of the forewing is less connected by dark shading with the costa. Yokohama, Hakodate, etc. *tetrica*.

A. pryeraria Leech (14 a) differs in its browner colour, differently formed median area, etc. Japan; *pryeraria*. Yokohama, Oiwake.

A. interruptaria Leech (14 a) shows in addition to the paired antemedian and postmedian lines a single median, touching a large black cellspot. Omei-shan, July — August. *interruptaria*.

A. albomaculata Leech (14 a) differs from all the other species in the conspicuous white spots at the apex and near the anal angle of the forewing. Japan: Oiwake and Gifu. Nearest to the Indian *subalbida* Warr. *albomaculata*.

A. concinna Warr. (described as *Abraxas*?) is very distinct in its chalky white ground colour and curved transverse rows of symmetrically arranged roundish brown-grey spots; basal third of forewing with irregular greyish markings; distal area with dark suffusion anteriorly and posteriorly, subterminal line distinct. Tibet, without more exact locality. *concinna*.

B. Antenna in ♂ pectinate (*Icterodes Hmps.*).

- clavaria.* **A. clavaria** *Leech* (14a) is darker than any of the preceding, with the bands less well expressed, a sub-terminal dark band, broadly interrupted by the veins, more conspicuous. W. China: Omei-shan and Pu-tsu-fang.
- similaria.* **A. similaria** *Leech* (14b) is another indefinitely marked species, rather larger than *clavaria*, more olivaceous, the cell-spot and submarginal band less black. Omei-shan.
- diffusaria.* **A. diffusaria** *Leech* (14f). Only the ♀ is known, but it is evidently related to the Indian *lapsariata* group. The irregularly white-spotted forewing and the white, dark-spotted hindwing are characteristic. Pu-tsu-fang.
- molossaria.* **A. molossaria** *Ob.* (14f) also belongs to this group, but has the white predominant on both wings. Possibly an extreme aberration of *lapsariata*, as OBERTHÜR mentions also much more heavily-marked specimens. Kwei-chow; perhaps not Palearctic.
- confusaria.* **A. confusaria** *Leech* is somewhat intermediate between the preceding and following groups, the markings of the forewing being more confused than in *melanaria*, in part broken up into coarse dusting, while on the hindwing the median band is more continuous than in most *melanaria*, the ground-colour proximally to this band white, distally yellow, marked nearly as *melanaria*. Rather smaller than *melanaria*. W.-China: Ta-chien-lu and Pu-tsu-fang.
- melanaria.* **A. melanaria** *L.* (14b). Forewing yellowish white, not or only very sparingly dark-dotted, but with numerous transverse rows of black spots. Ground-colour of hindwing yellow throughout. Very variable. The name-typical form inhabits parts of Central and North-eastern Europe and extends into Siberia. — ab. **hanseni** *Hedem.* has both wings wholly suffused with grey, the yellow of the hindwing faintly appearing about the veins. Irkutsk. — **askoldinaria** *Ob.* (= *sordida Btlr.*) (14b) has the forewing largely infuscated, with the black markings generally large, hindwing almost normal. Ussuri district and Korea. — **fraterna** *Btlr.* (14b) is distinguished by the broader white bands of the forewing. Hindwing on an average somewhat paler yellow. Japan. — **decolorata** *Stgr.* is a washed-out form from the Kentei Mountains, forewing dirty white or oftener light grey, hindwing pale yellowish or more greyish, the spots on both wings less deep black. — Larva yellow, with numerous waved black lines. On *Vaccinium uliginosum*.
- barteli.* **A. barteli** *spec. nov.* (23a). Larger than *melanaria askoldinaria* (14b), forewing rather broader, the anal angle being less rounded off; forewing more uniform yellowish (about as *transectata Walk.*), the postmedian rows of spots different, the distal, of them having long spots, especially that between the 5th subcostal and 1st radial vein, which displaces the corresponding spot of the proximal row basewards. Underside with less confluence of the spots than is usual in *melanaria*. Veins of the forewing more broadly yellowish. Mongolia, unfortunately without more exact locality, 27. July 1891, type (♂) in my collection, kindly presented by Herr MAX BARTEL.
- sparsa.* **A. sparsa** *Btlr.* (14b). Nearest to the *askoldinaria* form of *melanaria*, forewing much more dusted (sometimes wholly clouded), without definite white outer band; hindwing with grey suffusion at base, discal spot much smaller. Dharmasala, etc.
- flavovenaria.* **A. flavovenaria** *Leech* (14b) resembles dark forms of *sparsa* but has the principal veins of the forewing broadly yellowish. W. China; Omeishan and Pu-tsu-fang.
- undularia.* **A. undularia** *Leech* (14c). Rather larger and darker than the two preceding, the veins of the forewing dark smoky, the yellow ground colour consequently restricted to transverse rows of yellow spots or dots. Base of hindwing darker smoky, postmedian band broader. W.-China: Washan and Ta-chien-lu.
- flavomacularia.* **A. flavomacularia** *Leech* (14c). Again larger than *undularia*, more sharply marked, the yellow spots of forewing larger, postmedian band of hindwing wanting. W. China: Ta-chien-lu.
- lateraria.* **A. lateraria** *Leech* (14c) intermediate between the preceding and following groups, no yellow spotting on forewing, but with 2 rows of postmedian spots, besides some median ones, partly confluent with the first postmedian row. W.-China.

A. jaguarinaria Ob. (14 c). Differs essentially from the following in simple pattern of the hindwing *jaguarinaria* with its isolated cell-spot and bright but not broad yellow border. W. China: Wa-shan. Described from Kweichow.

A. jaguararia Guen. (= *gaschkevitchii* Motsch.) (14 c as *jaguararia*). Somewhat variable, forewing white *jaguararia* with grey costal and distal margins or grey throughout. Hindwing with distal half yellow, postmedian band developed. Japan and China, widely distributed.

A. flavomarginaria Brem. (14 d) is very distinct in appearance from all the other species, rather *flavomarginaria* resembling an *Obeidia*. The extent of the black markings varies greatly but the narrow yellow margin seems constant. Distributed in S. E. Siberia, Korea and China.

C. Antenna in ♂ shortly ciliated (*Phyllabraxas* Leech).

A. curvaria Leech (14 c). As our figures show, this and the species which follow have a different *curvaria* scheme of pattern from the more typical *Arichanna*. *curvaria* is easily recognized by the shape of the dark band formed by the coalescence of antemedian and median lines or stripes. W. China.

A. antiplasta nom. nov. (= *similaria* Leech [nom. praeocc.]) (14 d). On an average rather smaller, *antiplasta* central band differently formed, pale patch at apex of forewing rather more extended. The ground-colour, moreover, is more tinged with rufous. W. China: Pu-tsu-fang and Omeishan.

A. exsoletaria Leech has the median band less deeply coloured than in the two preceding, but much *exsoletaria* broader, the distal area very weakly marked; the space immediately beyond the postmedian line, as also the hindwing, slightly pale. Pu-tsu-fang. — **divisaria** Leech (14 d) is a form with the markings identical in shape but the median band of the forewing much darker and more reddish, the area beyond narrowly and the hindwing mostly white, the latter somewhat more distinctly marked than in the name-typical form. Omei-shan.

A. chiachiararia Ob. (17 a) is unknown to me. An obscure species, probably related to *diversicolor* Warr. *chiachiararia* from N. India, possibly, however, a *Micrabraxas*. Grey, darker dusted, with black cell marks, antemedian line angled in cell, postmedian placed near the cell-mark, subterminal consisting of a series of strong whitish lunules, proximally filled-in with black. Hindwing and underside weakly marked. Ta-chien-lu.

2. Genus: **Eulygdia** Warr.

Unknown to me, but would appear (from WARREN's description) to differ from *Arichanna* in having the distal margin of the hindwing crenulate, with a rather stronger projection at the 3rd radial, and in having the 1st and 2nd subcostal veins of the forewing coincident. Antenna in ♂ minutely serrate and pubescent. Erected for the following species.

E. tindzinaria Ob. (17 a) apparently differs from *Arichanna curvaria* in having a dark basal patch, *tindzinaria* dark midcostal spot, continuous dotted subterminal dark line, fuscous and reddish shades beyond, the rest of the wing remaining pale. Ta-chien-lu.

3. Genus: **Metabraxas** Blt.

Akin to *Pernia* but with the antenna in the ♂ pectinate, in the ♀ somewhat serrate or even very shortly pectinate. In the typical species, moreover (*clerica*, etc.) the 2nd subcostal of the forewing is stalked with the 3rd—5th, but in the species placed here by LEECH this is not the case. Confined to N. India and China.

M. clerica Blt. (14 d). White with base of forewing ochreous, discal spots rather large, postmedian *clerica* row of spots double, confluent, the distal usually bandlike, suffused. Japan. — **inconfusa** Warr. Postmedian double row of spots on forewing distinct throughout, not confluent or suffused. Chang Yang to Tibet.

M. rufonotaria Leech (14 d) is distinguished by the rufous marks placed on the large grey spots *rufonotaria* which form the bands. Omei-shan. Also from the Khasis.

incompositaria. **M. incompositaria** *Leech* (14 d). A large species, the spots washed-out brown-grey, not blackish. base of forewing almost without yellowish or reddish. Chang Yang, Central China.

nigromarginaria. **M. (?) nigromarginaria** *Leech* (14 d). Very distinct in the broad smoky black border of both wings: The wing-shape and rather more delicate build also suggest a doubt of the generic position. W. China; Wa-shan. The type remains unique.

4. Genus: **Dilophodes** *Warr.*

Antenna in ♂ with fascicles of cilia. Coxae and abdomen beneath furnished in ♂ with strong tufts of hair. Forewing with 1st and 2nd subcostals stalked, their stalk anastomosing with costal or forming a small loop so that only the 1st anastomoses. Fovea present in ♂.

Only one species known, ranging from Japan to N. India. Related to *Percnia* and *Abraxas*, but distinguished by the neurulation as well as the ♂ hair-tufts.

elegans. **D. elegans** *Btlr.* (17 a). Easily distinguished by the structure. Rather near *Pogonopygia conspicuaria* except in shape, but the submarginal and marginal spots are less elongate and form much more interrupted rows. In the name-typical race from Japan both wings are heavily black-spotted, though somewhat variable. A local race occurs in Central and W. China, approaching on the hindwing the Indian subspecies *hasiana* *Warr.*

5. Genus: **Pogonopygia** *Warr.*

Differs from *Dilophodes* in the narrower wings, especially of the ♂, and in the neurulation, the 1st and 2nd subcostals being free.

There seems to be only one species, *nigralbata* *Warr.*, described from Assam, from which the Palearctic form here given is perhaps scarcely differentiable.

conspicuaria. **P. conspicuaria** *Leech* (14 f) may be known by its shape, the smoothly and thinly scaled white ground-colour and the broad black borders, intersected by white veins and subterminal line, the latter often more or less interrupted or obsolescent. Gifu and Central China, widely distributed.

6. Genus: **Percnia** *Guen.*

Palpus rather short. Pectus densely hairy. Abdomen not tufted beneath. Forewing long and narrow; all the subcostals present, sometimes free, sometimes with anastomoses or connections. Fovea present.

Geographical distribution: N. India to Japan.

The genus, as at present constituted, embraces some little variations of structure, but is generally recognizable by the elongate white wings marked with rows of black spots, in the typical group all of small size. Most of the species are large or moderately so.

A. Antenna of ♂ with short pectinations (*Xenoplia* *Warr.*).

foraria. **P. foraria** *Guen.* (14 e). Smaller than the similarly marked species, in general clearer white, the forewing scarcely so narrow. Japan; China; N. India.

B. Antenna of ♂ ciliated (*Percnia*).

albinigrata. **P. albinigrata** *Warr.* (14 e). Almost pure white, more thickly scaled than most of the species, the spots very black, large, especially the postmedian series. Japan and nearly throughout China.

luridaria. **P. luridaria** *Leech* (14 e). Recognizable by the large blotches at apices, costal margin and especially at middle of inner margin of forewing. Superficially similar to *Metabraxas rufonotaria* but without the rufous marks and with different antenna. W. China: Mou-pin and N. W. of Cheng-fu.

grisearia. **P. grisearia** *Leech* (14 e). Base and apex of forewing strongly dark-suffused, postmedian row of spots followed on forewing by a strong, on hindwing by a slighter, narrower, often incomplete dark band. Central and W. China.

P. fumidaria *Leech* (14 e). Smaller than *grisearia*, the suffusions smoky brown, not blackish grey, *fumidaria* more extended but more indefinite; postmedian spots smaller. Central and W. China.

P. belluaria *Guen.* (= *guttata* *Feld.*) (14 e). Larger and rather narrow-winged than the two preceding, *belluaria*. no dark band distally to the postmedian dots. The dots (or spots) vary somewhat in size, perhaps smallest in specimens from Szechuan. — ab. **longimacula** *Warr.* has the spots more elongate, especially the postmedian *longimacula*. row. The spot on the base of the 2nd median vein is extended into a V-shaped mark along the veins. Kulu. — Distributed in Central and W. China and N. India.

P. giraffata *Guen.* (= *grandaria* *Feld.*) (14 f). A large species, the bands of spots on forewing double, *giraffata*. irregular in size, partly large, discal spot of both wings very large, enclosing a paler mark on the vein itself. Japan, Central and W. China, N. India, etc.

7. Genus: **Culcula** *Moore*.

Differs chiefly from *Percnia* in the absence of fovea. Abdomen robust, especially in the ♀, which is remarkable for a dense anal tuft, recalling the *Lymantriidae*. Forewing elongate, especially in the ♂, which has the distal margin straight and very oblique (sometimes faintly concave); 1st and 2nd subcostals shortly stalked. Hindwing relatively short and round, distal margin slightly undulate.

Only one species is known, inhabiting N. India and China.

C. exanthemata *Moore* (= *abraxata* *Leech*) (14 f). Coloration of some *Abraxas*, but larger, ♀ much *exanthemata*. larger than ♂; the yellow-mixed band from anal angle extends at least half across the wing. Kiukiang, Omei-shan, etc.

8. Genus: **Obeidia** *Walk.*

Face scarcely roughened. Palpus short or shortish. Antenna in ♂ with appressed serrations, ciliation minute. Abdomen in ♂ usually very long. Wings usually very narrow, yellow, at least at distal margin of hindwing. Forewing with all veins present.

Chiefly characteristic of China, but reaching N. India.

A. Wings very narrow; 2nd subcostal of forewing arising from cell.

O. vagipardata *Walk.* (14 h). Very variable in the extent and degree of confluence of the black spots *vagipardata*. but distinguishable from similarly coloured forms of *tigrata* by the absence of definite antemedian and postmedian rows of spots. Common in Central and W. China.

O. rongaria *Ob.* (14 h). This and the following species are unknown to me and perhaps do not belong *rongaria*. to this section. Both are distinct in the somewhat dusky, weakly marked hindwing. *rongaria* shows a very characteristic curved postmedian (subterminal) black band on the forewing. Tse-kou, Tibet.

O. idaria *Ob.* (15 a) shows, excepting the discal spot of the forewing, no large black markings, the *idaria*. wings being merely sprinkled with blackish dots. Tse-kou.

O. tigrata *Guen.* (14 g as *tigraria*) consists of a number of forms which are probably at least in *tigrata*. part local races, but have been little studied geographically. The name-type, with the ground-colour yellow throughout, belongs chiefly to S. China and perhaps does not reach the Palearctic Region. — **neglecta** *Th.-Mieg* *neglecta*. has the base and inner marginal area of the hindwing more or less extended white, sometimes leaving only a comparatively narrow yellow border. Korea, Chang Yang, W. China, etc. — **leopardaria** *Ob.* (17 a). Hindwing *leopardaria*. largely white, forewing also with white inner-marginal patch. W. China. — **decipiens** *Th.-Mieg*. Both wings *decipiens*. white with yellow borders. „N. China“ (WALKER); also on Formosa.

O. aurantiaca *Alph.* (17 a) is unknown to me but evidently an *Obeidia*. Similar to a very small *aurantiaca*. *tigrata* but with the postmedian band of spots much less angled. Abdomen dorsally sprinkled with black dots; both wings with basal area only weakly black-spotted. Taken on the River Hei-ho. Kan-su, N. W. China.

- gigantearia*. **O. gigantearia** *Leech* (14 g) may be known by its great size, very pointed wings, postmedian band of spots much less angulated outwards than in *tigrata*, the spot on 3rd radial confluent with the large cell-spot; sometimes all are confluent. Central and W. China.
- conspurcata*. **O. conspurcata** *Leech* (14 g). Not so large as *gigantearia*, wings not quite so pointed, the spots less black, more extended, much more confused, not forming definite bands. Central and W. China.
B. Wings less narrow; 2nd subcostal of forewing long-stalked with 3rd—5th.
- largeteauui*. **O. largeteauui** *Ob.* (14 h as *largetaui*). Easily distinguished from *tigrata* by its shape and by the longer and very neatly chequered fringes, the dark spots of which scarcely encroach on the wing-margin. The yellow is rather lighter than in *tigrata*, more glossy. Common in Central and W. China.
- languidata*. **O. languidata** *Walk.* (14 h) differs in being mostly white, only a narrow distal border of the hindwing remaining yellow. Postmedian band, except at costa, very far removed from cell-spot. Fringe of forewing dark, of hindwing chequered. Japan and Omei-shan. Also in N. India.

9. Genus: **Cystidia** *Hbn.*

Face hairy or with loosely appressed scales. Palpus moderate or longish, 2nd joint long-haired beneath. Antenna in ♂ thickened towards the extremity. Abdomen in ♂ extremely long. Wings very long and narrow. Forewing without fovea. All veins present.

Larva (*couaggaria*) with rudimentary (non-functional) legs on the 4th and 5th abdominal segments.

Only a few species known, Japan to N. India.

A. Face in the ♂ with long projecting hairs. Forewing with 2nd subcostal arising from cell.

stratonice. **C. stratonice** *Cram.* (= *agrionides* *Btlr.*) (14 g). Easily distinguished, apart from the structure, by the single, acutely angulated black postmedian band. Distributed in Eastern Asia.

chinensis. **C. chinensis** *Swinh.* (= *indrasana* *Leech* nec *Moore*) (14 g) has the black so extended as to leave only isolated spots of the white ground-colour. W. China: Mou-pin and Omei-shan.

B. Face with appressed scales. Forewing with 2nd subcostal from stalk of 3rd—5th.

couaggaria. **C. couaggaria** *Guen.* (= *eurypyle* *Mén.*, *eurymede* *Motsch.*, *interruptaria* *Feld.*, *lithosiaria* *Walk.*) (14 h). Both wings with subbasal, median and postmedian black bands, the two latter confluent at costa of both wings and hindmargin of forewing. Sometimes the black is greatly extended, covering most of the surface. In this case, the white remnants do not form the regular pattern of *chinensis*. Larva black, with interrupted yellow longitudinal lines and yellow segment-incisions; tubercles and setae minute. On *Prunus mume*. Pupa in a slight cocoon. Throughout China, S. E. Siberia, Korea and Japan.

10. Genus: **Neolythria** *Alph.*

Face with appressed scales. Palpus very short. Antenna in ♂ with fascicles of cilia. Hindtibia in ♂ dilated. Wings thinly scaled. Fovea wanting. Forewing with distal margin not very oblique; 1st and 2nd subcostals coincident, anastomosing with costal and usually anastomosing or connected with 3rd—5th subcostal. Hindwing with costal margin relatively long.

A. small genus, apparently confined to W. China and Tibet.

abraxaria. **N. abraxaria** *Alph.* (17 a). Very similar to *djrouchiaria*, the black less deep, the curved orange postmedian band obsolete, hindwing unmarked except for the discal dot and marginal spots. The name-typical form, from Szechuan, has the white distal band of the forewing rather broad, the band which precedes it not widening posteriorly, the white streak from base behind the median vein consequently longer. — **confinaria** *Leech* (14 h) has the distal white band quite narrow, sometimes interrupted about the radials, the dark band which precedes it gradually widening posteriorly. Che-tou and Ta-chien-lu; also occurs with the type between Tcha-tji-kow and Tchangla. July—August.

N. djrouchiaria *Ob.* (17 b). In the name-typical form the black at the costal margin and bordering *djrouchiaria*. the orange postmedian band is quite narrow and the hindwing has usually only slight traces of submarginal line. Ta-chien-lu, Mou-pin and Che-tou. — **montana** *Leech* is smaller, the black markings widened, hind-*montana*. wing with a larger black spot at apex and larger, partly connected submarginal spots. Common on the summit of Mount Omei in August.

N. tandjrinaria *Ob.* (15 a as *tjandjraria*). I am not sure that this is specifically distinct from the *tandjri-* *naria*. following, but it lacks the black discal dots and has a rather differently shaped, less reddish orange distal border to the forewing. Chang Yang, Ta-chien-lu and Chia-kou-ho.

N. consimilaria *Leech* shows on each wing a distinct black discal dot and has the black line pro-*consimi-* *laria*.ximally to the orange band somewhat angulated near the costal margin, the angle pointing basewards. Ta-chien-lu, Pu-tsu-fang and Wa-ssu-kow.

N. oberthüri *Leech* (14 h) differs in its broader orange border, elongate black cell-mark of the fore-*oberthüri*. wing and deeper black bands. Mou-pin and Huang-mu-chang.

N. nubiferaria *Leech* (14 h) is the most inconspicuous species, being even more thinly scaled than *nubiferaria*. the rest, the markings shadowy grey, chiefly confined to the costal and distal margins of the forewing. Probably related to *abraxaria*. Tibet: Hou-kow.

11. Genus: **Xanthabraxas** *Warr.*

Face rough-scaled. Palpus moderate. Antenna in ♂ thickened, lamellate. Forewing rather elongate, costal margin strongly convex at base and near apex, distal margin regularly curved; cell rather long, rather narrow at end; costal remote from subcostals, 1st and 2nd subcostals free.

Only one species is known, inhabiting China. Rather distinct in colour and markings, but showing little structural difference from *Obeidia*, *Cystidia*, etc.

X. hemionata *Guen.* (15 a). Recognizable at a glance by the bright yellow colour, sinuous bands and *hemionata*. dark rays on the veins distally. N. China, Central China and Mou-pin, etc. (W. China).

12. Genus: **Abraxas** *Leach*

Face smooth. Palpus rather short, shortly rough-scaled. Antenna in ♂ thickened with appressed serration. Hindtibia in ♂ dilated. Wings ample but rather weak, not very densely scaled. Fovea wanting. Forewing with 1st subcostal arising from 2nd and running into costal, or very exceptionally absent.

Larva in the typical species variegated, with large dorsal spots, secreting a nauseous fluid which renders it immune from the attacks of many insect-enemies. Pupa in the typical species black with yellow rings, not subterranean.

A moderately large genus, having its head-quarters in India, China and Japan but with a few stragglers in Europe and a few in the Malayan subregion and as far as N. Australia.

The species are often excessively abundant and although moderately conspicuous by day are little persecuted by birds, etc.

JOHN proposes to separate the *sylvata* group generically from *grossulariata*, under the name of *Calospilos* *Hbn.* — on account of a difference in the subcostal venation and the ♂ genitalia, but the former is inconstant and the latter not investigated in most of the extra-European species.

A. grossulariata *L.* (15 a). Distinct from nearly all the other species in the deeper black markings, *grossula-* *riata*. the rather large and generally regular marginal spots, the clearly defined yellow postmedian band, etc. Extraordinarily variable, especially in artificial breeding. Over 30 aberrations so obtained have received names from RAYNOR (*Ent. Rec.* vols. 15, 19, 21, 22); only a few of the principal forms can be considered here. — ab. **can-** *candida*. **dida** *Raynor* is entirely white, the position of the black markings faintly indicated in yellowish. — ab. **dohrnii** *dohrnii*. *Koenig* (= *deleta* *Ckll.*, *cuneifera* *Warr.*, *flavofasciata* *Huene*, *lacticolor* *Raynor*) is an important recurrent aberration which has been proved to show a somewhat complicated Mendelian inheritance. All the black markings are much reduced, the yellow subbasal and postmedian bands widened; hindwing white with minute discal dot, traces of postmedian vein-dots and reduced black terminal spots. It occurs chiefly in England and Russia. — ab. **chalcizona** *Raynor* resembles the preceding but has the yellow replaced by coppery bronze. — ab. *chalcizona*.

melanozona. **melanozona** Raynor has a large, round, isolated cellspot on the forewing and a very black postmedian band, the yellow much reduced. Occurs in Scotland. — ab. **lutea** Ckll. has the ground-colour yellow throughout. — *hazeleighensis*. ab. **hazeleighensis** Raynor is entirely black between the two yellow bands, excepting 2 small white anterior spots. — ab. **varleyata** Porritt (= *obscura* Ckll.) is entirely black except a narrow white band near the base of the forewing and a rather broader one at the base of the hindwing. N. England. — ab. **nigra** Raynor has both wings entirely black. — ab. **malmundariense** Donck. (= *nigroradiata* Rbl.) has the black markings proximally to the cell-spot much reduced, the veins and margins distally thereto black-rayed. — ab. **axantha minor** Raynor lacks the yellow bands. — **minor** Herz is a dwarfed form with paler yellow band, and seems to be a local race in E. Siberia and Korea. Small aberrations in Europe (*nana* Lambill.) do not deserve a separate name. — **ribesata** Stgr. also has the band pale yellow, indeed sometimes scarcely noticeable, but is chiefly distinguished by the more continuous postmedian band of the hindwing. Sealing rather thin. Ferghana to the Uliassutai district. — **conspurcata** Btlr. (15 a) has all the black markings strong and in addition a rather broad, straight antemedian band on the hindwing. Japan. Perhaps a good species. — Egg oval, dull yellow, scarcely glossy; the hexagonal reticulation is not deep but is marked by round knobs at the angles. Larva creamy white with black spots, those of the dorsal area large, only separated at the segment incisions; a reddish lateral stripe. Sometimes wholly black. On Prunus, in gardens also very destructive to species of Ribes, Euonymus, etc. Hibernates. Pupa black, with bright yellow incisions; in a slight cocoon or quite exposed. Moth in July—August, very abundant in a great part of Europe, W. Asia, etc.

flavisinuata. **A. flavisinuata** Warr. is intermediate between *grossulariata* and *sinicaria*, the yellow band coloured and formed as in the latter, the reduction of the irregular spots and suffusions, as well as its size, approximating it to *grossulariata*; hindwing quite as in that species, except that the terminal spots are longer and narrower, almost connected; forewing with a large costal spot close to apex, larger but weaker spots distally to the yellow half-band and pairs of small spots between these and the distal margin. Said to be from Japan. MOORE's ♀ „type“ of *picaria* may be a more spotted aberration of it. Possibly a local race of *sinicaria* or *picaria*.

sinicaria. **A. sinicaria** Leech (= *conspurcata* Bastelberger) differs from *grossulariata* in its somewhat more delicate build, less deep black markings and in having the forewing strongly but irregularly marked with grey spots and suffusions. The yellow band of the forewing is generally confined to the posterior half. Discal spot of hindwing usually very small, a distinct beginning of a yellow postmedian band on inner margin. Chang Yang (Central China) and Formosa. Possibly a form of the following.

picaria. **A. picaria** Moore. Build of the preceding, the markings deeper black. Extremely variable, but almost always recognizable by the fine black dusting which overspreads the wings. Unfortunately MOORE's type specimen (from Darjiling) scarcely shows this and is very similar to *sinicaria*; the yellow bands are moderately well expressed. N. India to W. China. — ab. **lutea** ab. nov. has the ground-colour yellow. I have specimens before me from Mou-pin and Ta-chien-lu (W. China) and Yatung (Tibet). — ab. **nebularia** Leech has the forewing heavily mottled and clouded with smoky brown. SWINHOE regards it as a species. — **semiturpis** Warr. is an extreme development of the preceding; forewing almost entirely obscured, a little white remaining at the apex and beyond the discal spot. Omei-shan. — ab. **grisearia** Leech has the forewing brownish grey, the white ground-colour remaining as a rather uniformly distributed white dusting or spotting. The yellow and black markings indicated. Not rare at Pu-tsu-fang.

tortuosaria. **A. tortuosaria** Leech (15 a) differs in the sparser dusting, absence of yellow markings and in the rather slender, posteriorly acutely indented postmedian band (thick line). Distributed in W. China.

curvilineararia. **A. curvilineararia** Leech (15 a). Markings less black, postmedian line much more gently curved, mixed with rust-colour; a rust-coloured basal patch. Chia-ting-fu, W. China.

reticularia. **A. reticularia** Leech (15 b). Very distinct in the dark longitudinal shade from base of costa to middle of distal margin. Distributed in W. China.

punctisignaria. **A. punctisignaria** Leech (15 b). This and the two following perhaps form a separate group, with yellow ground-colour, small discal spots and a pattern of black dots. In *punctisignaria* the deep yellow line, accompanied by some larger black dots, somewhat recalls the *grossulariata* group. Omei-shan and Moupin.

flavobasalis. **A. flavobasalis** Leech. Paler, the dots larger but less numerous, the yellow postmedian band restricted to the inner margins, base of forewing with an oblique yellow patch, on which stands a cluster of about 8 black spots. Chang Yang.

A. punctaria *Leech* (15 b). Smaller, the deep yellow markings as in *flavobasalis*, the dots smaller and more numerous; the presence of a subterminal series distinguishes it from both the preceding. Moupin.

A. fuscescens *Btlr.* (15 b). Forewing brown, with strong coarse fuscous irroration. Further characterized by the elongate, very obliquely placed cell-spot. Distributed in the N. W. Himalayas.

A. virginalis *Btlr.* (25 a) appears somewhat intermediate between the *grossulariata* and *sylvata* groups. It may be known by the shadow grey markings, with pale yellow incomplete band between two postmedian rows, and the ocellated cell-marks (nearly as in *pantaria*), that of the hindwing sometimes almost obsolete. Distributed in the N. W. Himalayas.

A. sylvata *Scop.* (= *ulmata* *F.*, *pantherata* *Hbn.*) (15 b) may be regarded as the type of a large and difficult group (*Calospilos* *Hbn.*). From most of its eastern allies it is distinguished by the unspotted apical area of both wings, the lighter grey markings, discal spot often elongate basewards, and the lighter or brighter rust-coloured admixture in the basal area and in the large inner-marginal blotch. — ab. **suffusa** *Tutt* (= *plum-bea* *Rbl.*) is entirely suffused with leaden grey. — ab. **intermedia** *Tutt* shows irregular patches of leaden grey suffusion. — In ab. **obscura** *Tutt* the suffusions are dirty ochreous or yellowish. This and the two preceding are only recorded from England, chiefly Yorkshire. — ab. **transversa** *Tutt* has a complete slaty-grey band across the middle of the forewing. — ab. **pantarioides** *Spitz* has the dark markings much reduced, resembling *pantaria*. A spot in the middle of the distal margin (though sometimes much reduced) and the dark head remain distinctive. — Egg pale greenish yellow, with hexagonal reticulation. Larva whitish, dorsally more yellowish, the longitudinal lines black, lateral stripe yellow; head black. On *Ulmus montana*, sometimes on *Prunus padus*, beech and hazel. The pupa hibernates in a slight cocoon on the ground; short and thick blackish brown, at the incisions lighter brown. The moth flies in May and June and is locally abundant from Central Europe to Central Asia.

A. orientalis *Stgr.* (15 b) is usually smaller, with the grey markings darker and much more extended, embracing the distal margin and fringe, sometimes the whole costal margin of the forewing, etc.; discal spot of forewing irregularly shaped, reaching the costal margin (in *sylvata* free or rarely with a narrow connecting spot), sometimes much enlarged, some spots between it and hindmargin (slight or wanting in *sylvata*). S. E. Siberia. A doubtful form from N. Japan (*intensa* *Ckll.*) may be provisionally united with it. Described as a variety of *sylvata*, which seems to me scarcely possible. It might rather be a dwarfed form of *miranda*. — **deminuta** *Warr.* is probably an aberration, with a continuous, though rather narrow, antemedian band on the hindwing. Japan.

A. miranda *Btlr.* (15 b) may be known by its large size (especially in the ♀), the tendency of the discal spots to join with large posterior spots so as to form a central band, the double postmedian row of the forewing commonly more or less strengthened, often partly confluent, especially the distal series, the corresponding pairs of spots on the hindwing usually separate, at least on the radial veins and 1st median. Ground-colour often rather more yellowish white than in the two preceding. Japan. — **latifasciata** *Warr.* is not quite so large, especially in the ♀, the postmedian spots, often also the median, still more thoroughly united into a band, the median of the hindwing much broadened, both wings with more dark spotting at apex. Japan. — ab. **continuata** *Warr.* is a further development of *latifasciata*, the postmedian band of both wings quite solid. Founded on one example. — **suffusa** *Warr.* represents *miranda* in Tibet and Szechuan. Smaller than *latifasciata*, the markings at least as dark, discal patch of both wings large, apical markings generally strong.

A. suspecta *Warr.* (15 b). Confusingly similar to *miranda*, like it in having the ♀ generally much larger than the ♂. The ♂ genitalia differ notably from the other species in having a pair of small triangular plates at base of uncus (= aborted „gnathos“). Smaller than *miranda*, especially in the 2nd brood, cleaner white, the spots slightly more bluish grey, small scattered spots or dots almost or entirely absent, median band very rarely complete, postmedian band of forewing interrupted at least between 1st and 2nd median, that of hindwing generally composed of single or confluent vein-spots, yet very variable. Described from Kiukiang. Common at Siccawei near Shanghai, whence I have received good material from my friend Dr. CULPIN. Also known to me from Wei-hai-wei and from Wei-chang, N. W. China. Egg slate-coloured. Larva black, with white longitudinal lines and white transverse markings on the first few and last few segments. It feeds on a deciduous plant which may be a species of dwarf elm. Moth in May and September, larva in June, the pupa aestivating.

culpini. **A. culpini** *sp. nov.* (15 c). Very like *suspecta* but certainly distinct. ♂ genitalia without the rudimentary „gnathos“, distinguished from the allies by the fineness of the projections from the valve edges and especially the „sacculus“, that on upper base of valve entirely different from *suspecta*. Sexes nearly equal in size. Discal spot of forewing generally not containing a small dark ocellus, which is conspicuous in *suspecta*, distal margin of forewing narrowly and evenly darkened, or with row of small, equal-sized spots, always lacking the large projection in the middle, which characterizes the allies. Postmedian row of spots of hindwing partly or entirely double, the two series often widely separated. Dotted and clouded specimens very frequent. Egg green. Larva on an evergreen, a species of box; similar to that of *suspecta* but with the lines more interrupted and irregular, all the segment-incisions more or less white. Moth in April, a partial 2nd brood in June and early July, some larvae aestivating and producing moths (often of small size) at the end of August and beginning of September. Only known from Shanghai. The discoverer, Dr. CULPIN, has taken and bred it in great numbers.

fulvobasalis. **A. fulvobasalis** *Warr.* is distinguished by having the basal patch almost entirely reddish fulvous, the discal spots reduced, postmedian row of spots on hindwing single, other dark markings slight. Possibly a form of *suspecta*. Distributed in Korea and Japan; ? China.

plumbeata. **A. plumbeata** (*Warr. Ms.*) *Ckll.* Larger than *miranda*, the wings perhaps not quite so broad, rather more strongly glossy. Markings rather less dark, more bluish lead-colour; central spot of forewing, postmedian band and marginal markings of both wings considerably enlarged; blotch near posterior angle of forewing also large, the rusty-yellow suffusion spreading proximally so as to encroach slightly on the white ground-colour. Founded on old specimens labelled „N. China“ in coll. Brit. Mus. Examples from Kiukiang and Foochow have since been received through the LEECH collection.

illuminata. **A. illuminata** *Warr.* (15 c). Very similar to the preceding, markings darker, less suffused, cell-spot of forewing generally less large, its centre white, hindwing with the median band wanting or very ill-developed, outer band of both wings generally more broken up into spots, the blotch near posterior angle of forewing commonly with the rust-yellow shade still further diffused. W. China and N. India.

pantaria. **A. pantaria** *L.* (15 c). Easily distinguished from the most weakly marked forms of *sylvata* by the yellow face and vertex, clearer yellowish basal area, etc. The name-type has distinct double row of postmedian spots. — ab. **cataria** *Guen.* (15 c) has the discal and postmedian dark markings almost entirely obsolete and is in general smaller. Possibly representing a partial 2nd brood. — Larva blue-grey, the black lines fine and more or less indistinct or interrupted; head yellow brown. On ash, hibernating. Pupa stumpy, reddish. Moth from end of April to July, according to the locality. S. and S. W. Europe, N. Africa and from the Southern Taurus to Persia.

macularia. **A. macularia** *Herz* differs from *pantaria* in the darker discal ocellus, black dots at distal margin, more extended brown-yellow basal patch, darker thorax, etc. Korea. Probably a *pantaria*-like aberration of one of the *sylvata* group.

13. Genus: **Lomaspilis** *Hbn.*

Closely allied to *Abraxas*, with which many systematists unite it. Except in its small size, smooth glossy abdomen, perhaps less strongly dilated hindleg and the absence (with rare exceptions) of the 1st subcostal vein of the forewing, it shows little that is distinctive. Only one species known. Palearctic.

marginata. **L. marginata** *L.* (= *staphyleata* *Scop.*, *maculata* *Hbn.*, *naevaria* *Hbn.*) (15 d, as *macularia*). Extremely variable. LINNÉ's form has complete black border to both wings, also on the forewing additional spots or patches at base and middle of costa. SCOPOLI's *staphyleata* with the addition of spots at middle of inner margins, and HUBNER's *maculata* with these further enlarged, need not be separated. — In ab. **nigrofasciata** *Schöyen* (= *marginaria* *Hbn.*) (15 d) the median band, at least on the forewing, is complete, the marginal area is normal. — ab. **mediofasciata** *Höfner* (= *huenei* *Strand*) has a complete median band but no marginal band. — ab. **dumeei** *Joannis* lacks also the basal costal patch. — ab. **suffusa** *nom. nov.* (= *staphyleata* *Huene* nec *Scop.*) has the ground-colour suffused with smoky yellow-grey, the dark markings weak and blurred. — ab. **nigro-unicolorata** *Haverkamp* is black throughout. — ab. **pollutaria** *Hbn.* (= *limbata* *Hormuz.*, *demarginata* *Fuchs*) (15 d) has a narrow band of the ground-colour at the distal margin, reducing and dividing into 2 parts the black marginal band. — ab. **subdeleta** *Ckll.* (= *wendlandtiata* *Fuchs*). Forewing with marginal band almost or

altogether obsolete, narrow patches at base and middle of costa remaining, hindwing unmarked. — ab. **conflua** Strand. Costal patches confluent, also confluent with the marginal band. Median area normal. — *conflua*. **opis** Btlr. (= *amurensis* Hedem.) (15 d) has on each wing three large median spots, longer than broad. It forms *opis*. a local race in S. E. Siberia and Japan. — Egg yellow-green, with hexagonal reticulation. Larva green with darker dorsal lines and purplish anal spot. On sawfly. — On the wing May—July or even later. Widely distributed, Europe to Central Asia, N. E. Siberia, etc.

14. Genus: **Ligdia** Guen.

Near the two preceding, palpus stronger, upcurved, 2nd joint longer-scaled above, thorax dorsally less smooth; forewing with venation as in *Abraxas*, rarely with 1st subcostal anastomosing with costal, often with 2nd anastomosing or connected with 3rd—4th; distal margin of hindwing less smooth. A small genus, though represented in Europe, Asia and Africa.

L. adustata Schiff. (15 d as *adustaria*). Glossy white, suffused almost throughout with a yellow-ochreous *adustata*. tinge, the anterior part of forewing sometimes clearer white; cell-dot darker ochreous, often inconspicuous; the form of the distal markings of forewing can be seen from our figure. — ab. **suffusa** ab. nov. has the *suffusa*. pale area completely infuscated. — Larva moderately stout, bright green with red dorsal spots, a red lateral blotch on the 1st—2nd abdominals and red marks on claspers; a rare variety grey-brown. The pupa hibernates; red-brown with blackish wings. — The moth is partially double-brooded. Central Europe to Asia Minor.

L. coctata Guen. (= *efferata* Walk., *restitutata* Walk., *lassulata* Rghfr., *inspersata* Stgr.) (15 d). Very *coctata*. similar to *adustata*, forewing rather more elongate anteriorly; less glossy, duller coloured, rather more grey-dusted, discal dot of forewing greyer, generally more conspicuous, sometimes forming a minute ocellus; postmedian line forming a deeper angle anteriorly and some minute blackish teeth on the 3rd radial and the medians. Widely distributed in N. India and Central Asia.

L. japonaria Leech (= *japoniata* Stgr.). As glossy as *adustata*, less yellowish white, basal patch of fore- *japonaria*. wing larger, both wings with large dark grey cell-spot, hindwing with conspicuous broad dark grey postmedian band. Japan; LEECH's series from Oiwake only.

L. ciliaria Leech (15 d) nearest *japonaria* but very distinct in the long bright golden-brown fringes and *ciliaria*. in having the broad marginal band interrupted in the middle but reaching to the apex. Japan: Oiwake, only the type known. This is abnormal in neurulation, the first 2 subcostals coincident, anastomosing with the costal and then connected by a bar with the 3rd—4th subcostal.

15. Genus: **Myrteta** Walk.

Face smooth. Palpus short and rather slender. Antenna in ♂ commonly bipectinate. Wings ample, with apices rather pronounced, hindwing with distal margin nearly always rather straight (occasionally subcrenulate) from apex to middle, often bent or angled at 3rd radial. Forewing with 1st—2nd subcostals stalked, anastomosing with costal.

A small Indian genus with two true Palearctic representatives and a few others on the confines of the region. The wing-pattern is often characteristic.

A. Antenna in ♂ bipectinate. Hindwing not angled (*Myrteta*).

M. sinensaria Leech. Very near the Indian *plenaria* Walk. figured in Vol. XII, but still darker and with *sinensaria*. thicker lines. Differs from the two following species in the strong brown-grey suffusions, especially on the forewing, and the duller and more restricted yellow anal patch of the hindwing, containing a much larger black spot on the 2nd median but none on the other veins. Mou-pin, only the type known.

M. tripunctaria Leech (15 c) is characterized by the slender lines of the forewing, the 3 conspicuous *tripunctaria*. black spots at the margin of the hindwing, etc. Mou-pin, only the type known.

M. angelica Btlr. Near *tripunctaria* (15 c), lines less slender, hindwing with yellow suffusion extending *angelica*. narrowly as far as the 1st radial, black spots (sometimes ill defined) on the median veins only, postmedian line represented by a spot near anal angle and a row of vein-dots as far as the 3rd radial, receding from the distal margin. Japan: Yokohama, Nikko, Oiwake, etc.

M. sericea Btlr. (15 d). Very distinct in having the lines yellow-brownish, fine and indistinct, in part *sericea*. double, oblique in the opposite direction, developed on both wings; no yellow blotch on hindwing. Perhaps a separate subgenus or genus (*Orthocabera* Warr.). Japan. A local race in India.

moupinaria. **M. moupinaria** *Ob.* Larger and with less markings. Forewing only with an oblique line from middle of hindmargin running towards apex but becoming obsolete about the 1st radial and a still shorter line distally thereto. Hindwing with 2 lines. Mou-pin.

tinagmaria. **M. tinagmaria** *Guen.* (15 d). This and a closely related Indian species (*luteifrons* *Swinh.*) have the shape and external appearance of *Cabera* but may be known at once by the face, which is pure white below, bright reddish fulvous above. In structure they only deviate from typical *Myrteta* in that the ♂ forewing has a fovea. *tinagmaria* differs from *luteifrons* in the conspicuous black discal dots. Distributed throughout China.

conspersaria. **M. conspersaria** *Leech* (15 c) also belongs here, unless it forms a new genus. Hindleg in ♂ short, the tibia very thick, discocellulars strongly angled inwards, stalk of first 2 subcostals arising from that of the others. Known by the black dots and the macular bands. Oiwake.

B. Antenna in ♂ almost simple. Hindwing with a small rounded projection in middle (*Micronidia* *Moore*).

argentaria. **M. argentaria** *Leech* (15 c). Characterized by its very strong bluish-silvery sheen, very weak, though rather thick greyer lines and single conspicuous black spot on the lobe of the hindwing. W. China: Omei-shan, etc. Its nearest allies are from Sikkim.

C. Antenna in ♂ almost simple. Hindwing rounded (*Taeniophila* *Stgr.*).

unio. **M. unio** *Ob.* (= *askoldaria* *Chr.*, *magna* *Btlr.*) (15 d). White with grey bands, the postmedian slightly interrupted on the veins. Forewing with black discal dot rather variable in size. Japan and Ussuri district.

16. Genus: **Bapta** *Steph.*

Differs from *Myrteta* in the more regularly rounded hindwing, with simpler pattern, and especially in having the 2nd subcostal of the forewing stalked with the 3rd—5th. ♂ antenna simple. — The few known larvae are smooth, cylindrical, with somewhat flattened head. — Geographical range: Palearctic, Indo-Australian (chiefly N. W.) and American.

A. Cell of forewing short, 1st subcostal long-stalked with the others (*Leucetaera* *Warr.*).

inamata. **B. inamata** *Walk.* (= *simpliciaris* *Walk.*, *luciferata* *Walk.*) (15 e). Very distinct in its frequently ochreous tone, single strong, straight, darker ochreous-fulvous postmedian line and dark fringes. Distributed throughout India and to Borneo; one example has been taken at Satsuma.

B. Cell of forewing normal, 1st subcostal arising from the 2nd.

simplicior. **B. simplicior** *Btlr.* (= *pallidaria* *Leech*) (15 e). Generic position uncertain, aspect of a *Lomographa*. Recognizable by the pale ground-colour, the shape of the postmedian line of the forewing and the brown shading distally to it, with a more brownish spot at inner margin. Japan.

C. Cell of forewing normal, 1st subcostal not stalked. Wings delicate, forewing very broad, dark coloured, 1st subcostal anastomosing strongly with costal (*Aleucis* *Curt.* = *Anhibernia* *Stgr.*).

distinctata. **B. distinctata** *H.-Sch.* (= *pictaria* *Curt.* nec *Thnbg.*) (15 e). Very like *Theria rupicapraris* *Schiff.* (18 i). ♂ but smaller, with simple antenna, abdomen with white dorsal dots. Local in Central Europe; ?Asia Minor. — *contrastaria*. ab. *contrastaria* *Fuchs* has the median area darkened. — *orientalis* *Stgr.*, the usual eastern form, is paler, more greyish. Asia Minor, Palestine and Mardin. — Egg cylindrical with rounded ends, shiny, with minute hexagonal reticulation; yellowish, changing to red, micropyle marked with black dots. Larva brown with V-shaped blackish dorsal marks and on the 3rd and 4th abdominal segments with white marks. On blackthorn. The moth flies about blackthorn bushes in April.

D. Cell of forewing normal, 1st subcostal not or very shortly stalked. Wings moderately robust, forewing not exceptionally broad, white, 1st subcostal anastomosing shortly or free (*Bapta*).

bimaculata. **B. bimaculata** *F.* (= *taminata* *Schiff.*) (17 b). White with very strong dark costal spots at the origin of the faint brown lines. — ab. *brunneimargo* ab. nov. Distal margin of forewing nearly to the postmedian line with strong brown suffusion, the lines generally better expressed. Not uncommon in some parts of Europe and Japan, unknown in England. — *subnotata* *Warr.* (= *bipunctata* *Fuchs*) (15 e as *bipunctata*) has the costal spots strongly reduced. It is the commonest form in Japan, but occurs as an aberration elsewhere. — Larva

green, generally with red dorsal line, widening into lozenge-shaped blotches on some of the segments. On *Prunus avium*, whitethorn, etc. The pupa hibernates. Flight-time about May, local but widely distributed in Central and E. Europe, E. Asia, etc.

B. temerata Schiff. (= *punctata* F. nec Cl., *sylvestrata* Hbn.) (15 e). Recognizable by the dark clouding in the distal part of the forewing, though this varies greatly in intensity and always leaves free (at least in part) a broad white dentate subterminal line. — Larva variable, in general similar to the preceding. On hawthorn, blackthorn, birch, etc. The pupa hibernates. Moth in May—June, similarly distributed to the preceding, also recorded from Transcaucasia and Issyk-kul. *temerata*.

B. foedata Warr. (= *mytylata* Leech nec Guen.). Less snowy white than *temerata* (15 e) the wings being densely sprinkled with grey atoms. Lines thick, very vague, merely formed of denser grey dusting; postmedian double; no dark clouds distally to it. Underside white, unmarked, or rarely with minute discal dots; basal area of forewing without or only with light greyish suffusion. Japan. — **subtaminata** form. nov. (= *fo. data subtaminata* Leech) is more yellowish white, postmedian line single; underside with dark smoky suffusion on the disc of the forewing, postmedian line at least indicated, cell-dots present. Chang Yang and Ta-chien-lu, June—July. *nata*.

B. distans Warr. (= ? *ochrilinea* Warr.) (15 e). Larger, forewing rather more pointed. White, extreme costal edge of forewing yellow; discal dot minute or sometimes wanting, a fine greyish postmedian line about midway between this and the termen; fringe white. WARREN's type, said to be from Japan, is less iridescent white, the line is placed slightly further from the termen. The form before me is from Sikkim, Dharmasala and Wa-shan and has been confused with *alba* Moore, from which it differs in the face and palpus, which are wholly bright ochreous, not white below, in having the discal dot beneath minute or obsolete, the postmedian line here obsolete, etc. At Dharmasala, at 2000 m. elevation, *distans* has been bred in June from cherry; a preserved larva before me is yellowish (probably discoloured from green) with red marks on the face and a pale yellowish dorsal line, only distinct at the end of each segment, where it is marked on each side by a short red dash. *distans*.

B. platyleucata Walk. (15 e as *platyleucaria*) differs in its strong grey dusting and strong lines on the postmedian forming a gentle inward curve, a whiter band beyond it. N. India; W. China: Pu-tsu-fong; Afghanistan. *cata*.

B. nigropunctaria Leech. Slightly more brownish, lines diffuse, weak; distinguished at once by an elongate black dot (short line) along costal margin of forewing close to apex. W. China: Mou-pin and Ta-chien-lu. *nigropunctaria*.

17. Genus: **Crypsicometa** Warr.

Characters of *Bapta*, abdomen more robust, wings rather longer, margins well rounded, 1st subcostal of forewing anastomosing both with costal and with 2nd subcostal. In the typical species (*incertaria*)² the ♂ bears a tuft of hair on the inner margin of the forewing beneath. A second species (*particolor* Warr., described as *Orthobrachia*) lacks this character.

O. incertaria Leech (15 e). Unmistakable in its normal form on account of the rounded pale subapical patch. Yokohama and Gifu. LEECH had a larger, browner ♀ from Mou-pin. — ab. **plana** Wileman is without markings excepting the black discal dots. — **suffusa** Leech, from Kiushiu, is smaller, rather browner, with much stronger dark suffusions. *incertaria*.

18. Genus: **Parabapta** Warr.

Shape nearly as in *Bapta*, only rather narrower. Neuration of *Myrteta* but with the 1st—2nd subcostals rarely if ever anastomosing with the costal. Antenna in ♂ not pectinate.

Only the two species known; eastern Palearctic. Founded by WARREN on *aetheriata* only, on account of the ♂ antenna; but the shape, colour and neuration show the close relationship of *clarissa*.

A. Antenna in ♂ simple.

P. clarissa Btlr. (15 e). Very pale yellow, both wings with nearly straight, slightly oblique postmedian line, forewing also with an antemedian. Japan and S. E. Siberia. *clarissa*.

B. Antenna in ♂ with fascicles of cilia (*Parabapta*).

P. aetheriata Graes. is distinguished by the rather broader wings and weaker markings as well as by the structure of the ♂ antenna. Ussuri district. *aetheriata*.

19. Genus: **Peratophyga** Warr.

Small, delicately built, glossy moths, similar to *Lomographa* but with the 2nd subcostal of the forewing stalked as in *Bapta* or *Cabera*; distinct from both in having the 2nd radial of the forewing stalked with the 1st.

Only 2 or 3 species are known, all Asiatic.

- aerata*. **P. aerata** Moore (= *grata* Btlr.) (15 f). Ochreous with ill-defined basal, antemedian, submarginal and sometimes marginal bands of purplish fuscous, which vary much in distinctness. In the forms from Kulu and some of those from other Indian localities the dark submarginal band is narrow and occasionally weak. N. India, China, Japan and Formosa; widely distributed.

20. Genus: **Lomographa** Hbn.

Face smooth. Palpus short or shortish, rough-scaled. Forewing with the 1st and 2nd subcostals coincident (in *honesta* long-stalked). Fovea wanting, except in *dalmataria*.

A widely distributed genus in the Old World but not rich in species. It is generally known by the name of *Stegania* Dup., but MEYRICK revived HÜBNER's older name.

A. Antenna in ♂ ciliated (*Heterostegane* Hmps.).

- cararia*. **L. cararia** Hbn. (15 f). Distinct in having only a submarginal line well developed, commencing near apex and running to anal angle, twice angled outwards, with rays running from the angles to the distal margin. The larva is said probably to feed on poplar but I am unacquainted with any description of it. Flight-time June—July. Local: Piedmont to Galicia; Sarepta; Amurland and the Ussuri district.

- hyriaria*. **L. hyriaria** Warr. (= *irroraria* Leech) (15 f). Smaller, the irroration more reddish, sometimes much sparser, antemedian line developed, sometimes also on hindwing a postmedian, the characteristic submarginal on forewing only. Japan, Korea and N. E. China.

B. Antenna in ♂ pectinated (*Lomographa*).

- trimaculata*. **L. trimaculata** Vill. (= *permutataria* Hbn., *albicaria* Brd.) (15 f) may be known in its typical form by the pale colour and the 3 dark costal marks of the forewing. — ab. *bermeja* Ribbe, from Andalusia, is said to be smaller and lighter, almost markingless. — ab. *cognataria* Led. is densely irrorated and clouded with fuscous, especially in the proximal half and along the hindmarginal area of the forewing. S. France, Spain and Portugal; very extreme examples occur at Digne. — Larva green with red-brown dorsal stripe and interrupted whitish subdorsal; on poplar. *trimaculata* is generally double-brooded, May and again in August. S. W. and southern Central Europe and N. Africa.

- pulverata*. **L. pulverata** B.-Haas. Wings rather more elongate, less broad but less pointed than in *trimaculata*, pectinations shorter; grey-yellow, regularly dusted with brownish scales; markings similar, the postmedian more acutely angled at 1st radial, more dentate posteriorly; costal spots strong, almost black, but the 3rd (distal) wanting, as in *honestata*; fringes chequered. Askold and Ussuri.

- ochrearia*. **L. ochrearia** B.-Haas (15 f). Ochre-yellow, the lines similar to those of *trimaculata* but not arising from enlarged costal spots; base of forewing at costal margin somewhat infuscated; distally to the postmedian line of the forewing an interrupted band of dark spots, best developed from the hindmargin to the median veins. Tunis: Ain Draham; Algeria: Batna.

- honestata*. **L. honestata** Prout (15 f). More robust and glossy than the other species, under surface almost unmarked; perhaps a new genus, or new section (♂ antenna pectinated) of *Parabapta*, with which it more nearly agrees in neuration. Markings nearly as in *trimaculata*, colour entirely different, outermost costal spot wanting. Tientsin.

- dilectaria*. **L. dilectaria** Hbn. (= ? *commutaria* Hbn.) (15 f). Nearest to *trimaculata* ab. *cognataria* but with the dark clouding densest in the anal area of the forewing; lines rather thick, not starting from darker spots, postmedian projecting less far at 1st radial, but making a second bend between 3rd radial and 1st median. Larva pale green, the segment-incisions yellow, a light, red-edged dorsal line and a distinct yellowish subdorsal. On *Populus nigra*. Pupa thick, blackish brown, hibernating. There are two generations. A very local species, chiefly belonging to Austro-Hungary; also recorded from Galicia, Transcaucasia and the Taurus.

- dalmataria*. **L. dalmataria** Guen. (25 i) is remarkably distinct not only in the longer forewing and grey (not brown) markings, as mentioned by GUENÉE, but also in the peculiar form of the postmedian line, with its sharp

angle outwards on the 1st radial and deep irregular sinus inwards between this and the 2nd median. The name-typical form inhabits S. E. Russia and Central Asia (Transcaucasia to the Ili district). — *arenaria arenaria*. *Stgr.*, from Kashgar, also as an aberration in Transcaspi, is more sand-coloured, less sharply marked, not irrorated with grey, the distal area brownish.

C. Antenna in ♂ simple.

L. deletaria Moore (15 f) an Assam species, has recently been recorded by WILEMAN from Yamato, *deletaria*. Japan, in the form *indistincta* Moore. HAMPSON places it in *Bapta* (*Leucetaera*) but it falls here by his „Key“; *indistincta*. probably a distinct genus. Larger, smoother-scaled and more pinkish brown or purple-brown than the other species, apex of forewing acute or subfalcate, distal margin of hindwing elbowed in middle. Variable, the lines generally weak, irregularly sinuous and in places dentate, oblique outward, the curved beginning of a curved blackish line (or 3 blackish spots) from costal margin of forewing near apex. Underside unmarked.

21. Genus: **Ninodes** Warr.

Rather more robust than *Lomographa*, scaling coarser, costal margin of forewing more rounded, antenna in ♂ merely pubescent, forewing with a fovea.

The type species inhabits Japan. A second species has been described from New Guinea.

N. splendens Btlr. (15 f). Strikingly distinct in the extended dark basal area of hindwing and posterior part of forewing except distally, the metallic scales on the dark areas, metallic, strongly sinuous post-median line, etc. Japan, Korea, E. China, Ichang, Ta-chien-lu. *splendens*.

N. scintillans Th.-Mieg, spec. nov. (17 b) —, ♂ 15 mm. Ground-colour pale yellow, shaded in places *scintillans*. with gold-yellow, especially in the outer half of the wings. In addition, the scales are in part roughened, which gives to the wings a brilliant gloss. Forewing with costa brownblack mixed with yellow scales except at the apex, which is yellow. An undulate, brown-black, irregular transverse band starts from the costa at 2 mm from apex and ends at the inner margin 2 mm from the angle. There are further 3 brown-black spots on the inner margin between the band and the base. A small brown-black spot at the distal margin on vein 5. A row of small brown-black terminal dots between the veins. One sees also some small brown-black striae at the distal margin, especially towards the hinder angle. A black cell-dot. Fringe yellow, that of the inner margin black. Hindwing with a transverse, undulate brown-black band continuing that of the forewing. Another band, not undulate, starts from the abdominal margin 1.5 mm from the base, broadens and runs to the costa, of which it covers a large part. A small brown-black cell-spot coalesces with this band on one side. A small brown-black mark, 1 mm long and perpendicular to the abdominal margin is placed on this margin between the 2 bands. [Some small brown-black striae at the distal margin, chiefly between vein 4 and the apex and towards the anal angle. Fringe yellow. Underside pale yellow, without trace of gold-yellow. The undulate brown-black band of the upperside, parallel to the distal margin, present; it is paler and there is a small brown-black spot, between the veins, at the distal margin of each wing. Costa of forewing almost entirely brown-black, slightly irrorated with pale yellow; proximal half of the wing partly covered with brown-black scales; some brown-black marks between the undulate band and the distal margin. A small brown-black cell-dot; fringe pale yellow. On the hindwing some brown-black striae at the distal margin between vein 4 and the apex and along the costa. A small brown-black cell-spot. Palpus and face brown, vertex yellow, collar brown-black, tegulae pale yellow with the extremity brown-black. Abdomen pale yellow with a brown-black dorsal spot on each segment. ♀ 18 mm. Siccawei (environs of Shanghai) 2 ♂, 1 ♀, my coll.; several ♂ and ♀, coll. DE JOANNIS. Ichang (ex coll. LEECH) 1 ♂, coll. Brit. Mus. (THIERRY-MIEG in litt.)

22. Genus: **Pogonitis** Chr.

Structure of *Cabera* but rounder-winged, the anal angle of the forewing, especially in the ♂, rounded off, the hindmargin also in the ♂ rounded, bearing a curled patch of scent-(?) scales. Fovea of the ♂ hindwing very strongly developed, the costal area at base somewhat expanded.

Only one species known, inhabiting S. E. Siberia and Japan.

P. cumulata Chr. (15 f). Pale yellowish, the discal dots large and black, the clouds of dark dusting *cumulata*. or strigulation placed somewhat in the same positions as in *Ninodes splendens* but often weaker, unicolorous, on the hindwing less extended. Amur and Ussuri districts and Japan.

23. Genus: **Cabera** Tr.

Face smooth or nearly so. Palpus shortish or moderate, rough-scaled. Antenna in ♂ bipectinate. Forewing without fovea, all veins present, 2nd subcostal arising from stalk of 3rd—4th beyond 5th. Hindwing with fovea at base anteriorly to costal vein. A small genus, Palearctic, Indo-Australian and N. American.

pusaria. **C. pusaria** L. (15 g, as *pusata*). White with slight grey dusting and fine grey lines, on forewing 3
ablataria. (the first curved), on hindwing 2. — ab. **ablataria** Fuchs (= *monotonica* Strand, *striaria* Hbn. praeocc.) has the
heveraria. lines almost or entirely obsolete. — ab. **heveraria** H.-Schäff. (= *melania* Ob.) is a rare form in which the
rotundaria. grey dusting densely covers almost the entire wings. England, Germany and Austria. — ab. **rotundaria** Haw.
 (= *confinaria* Frr.) is a rounder-winged form with the first lines strongly approximated. Said to be the
 product of under-feeding the larvae. — Larva elongate, with rather flattened head; green with purplish brown
 or blackish dorsal spots, or grey mixed with reddish, or sometimes yellowish; very variable. On birch and
 alder. Pupa compact, brown, the wings olive-green; hibernating. On the wing through a great part of
 the summer, irregularly double-brooded. Europe, generally abundant, Transcaucasia, N. Persia and E. Si-
 beria. — hybr. **fletcheri** Tutt (*pusaria* ♂ × *exanthemata* ♀) is just intermediate between the parent forms,
 rather pure white, the lines tinged with ochreous.

exanthema-
ta. **C. exanthemata** Scop. (= *striaria* Hbn.) (15 g) is slightly shorter-winged, more tinged with ochreous,
 the irroration (which is generally stronger) and the lines being ochreous grey; lines rather more denticulate.
arenosaria. — ab. **arenosaria** Haw. (= *nogentina* Th.-Mieg) is darker, more strongly dusted, the lines sometimes scarcely
 or not at all differentiated. — ab. **approximaria** Haw. has the first 2 lines closely approximated, almost coales-
approxi-
maria. cent. — ab. **pellagraria** Guen. is said to be larger, apex of forewing more produced, colour whiter, less irrorated,
pellegraria. lines perhaps less waved, both wings with a black discal dot. Lyons. — ab. **unicolorata** Teich, almost unicolor-
unicolorata. ous white, is said to be a prevalent form in Livonia. — Egg oval, green, with fine reticulation. Larva
 very variable, green or brown, usually with dark dorsal markings and sometimes with white dots. Perhaps
 rather thicker than *pusaria* larva. On willow, etc. Pupa similar to that of *pusaria*. Range nearly the same,
 but apparently more distributed in Central Asia.

schaefferi. **C. schaefferi** Brem. (15 g) is, as LEECH says, a separate species, characterized by the distinct yellow
 bands, which are not denticulate, ground-colour cleaner white; all the lines of the forewing are curved
sinicaria. basewards anteriorly. S. E. Siberia, Korea and Japan. — **sinicaria** Leech has the ground-colour more yellowish
 white, thus at first sight more like *exanthemata*, but with the lines as in *schaefferi*. W. China: Ta-chien-lu.

purus. **C. purus** Btlr. (15 g) is also very similar to *exanthemata*, the ground-colour cleaner white, the lines rather
 more markedly dentate, curving nearly as in *schaefferi*, from which it differs, apart from the dentate lines,
 in having a fine grey irroration and on both wings a black discal dot. Japan and Korea.

punctata. **C. punctata** Warr. (= *candidaria* Leech) (15 g). Structurally distinct in having the 1st subcostal vein
 stalked with the others, superficially in its macular bands, which are somewhat variable in distinctness. Ground-
 colour chalky white. Japan: Oiwake.

griseolim-
bata. **C. griseolimbata** Ob. (= *straminea* Btlr., *ustulataria* Chr.) (15 g). Apparently not clearly related to
 the other species, but agreeing in structure. Superficially more like a *Lomographa*, very distinct in the reticu-
 lated appearance, due to the dark veins, and in the broad dark border of the hindwing and of the posterior part
 of the forewing. Ussuri district and Japan.

rufofasci-
aria. **C. (?) rufofasciaria** Leech. Also very distinct. Pale ochreous brownish with black discal dots, the fore-
 wing with broad diffuse rufous outer band. Chang Yang, Central China, only the type known, a ♀, aberrant
 in its pectinate antenna and rather longer palpus. Perhaps a separate genus.

24. Genus: **Synegia** Guen.

Related to the preceding group but differing in the longer palpus and altogether more slender build,
 the ♂ abdomen being long and thin, antenna long, legs long and slender. ♂ antenna generally pectinated,
 but variable. ♂ retinaculum often modified either into a dense hairtuft or into a spatulate plate.

hadassa. **S. hadassa** Btlr. (15 g). ♂ antenna with moderate, slender pectinations; retinaculum normal. Bright
 ochreous, irrorated with fuscous; both wings with black discal dot. Very variable. In the name-type the fus-
 cous irroration is massed so as to form cloudy bands bordering the median area (the postmedian dentate)
 and forming a dark proximal (and sometimes distal) shading to a dentate subterminal line of the ground-
inconspi-
cua. colour. — ab. **inconspicua** Btlr. has the irroration more reddish, giving to the entire wings a brighter ochreous
unicolor. tone, the cloudy bands more or less weak. — ab. **unicolor** Wileman has the irroration coloured as in the
suffusa. type, but entirely lacks the bands. — **suffusa** form. nov. has the hindwing and a great part of the forewing
 dark-suffused, leaving free the basal area, the cell and a narrowing streak from this to the apex, crossed
 by the postmedian and subterminal dark bands, a still darker dentate postmedian line usually distinct. All
 specimens from Kiushiu are of this form or transitions. — *hadassa* is distributed in Japan; also known
 from Chang Yang, Chow-pin-sa and Mou-pin.

S. limitata Warr. (15 h). Rather paler, with slight antemedian, strong thick postmedian and complete *limitata*. or partial subterminal dark lines, also a characteristic longitudinal streak from the postmedian of the forewing to the distal margin. Japan, Chang Yang and Omei-shan. This and the following may be also forms of *hadassa*.

S. esther Btlr. is distinguished by the still darker lines and by the very strong dark clouding which *esther*. occupies most of the distal area of the forewing and in the posterior half crosses the postmedian line. Japan: Yokohama, Hakone, Kiushiu.

S. omissa Warr. is perhaps slightly narrower winged. Ground-colour paler, more yellowish, but with *omissa*. the olive-fusca irroration and clouding so dense as to leave only dots and spots of the ground-colour, thick antemedian and postmedian and slender subterminal dentate yellow lines, the antemedian present on forewing only, the subterminal generally much interrupted, especially on the hindwing. S. Japan and the Liu-Kiu Islands. Also from Hankow.

S. purpurascens Warr. (= *rosearia* Leech) (15 g). ♂ antennal pectinations of the outer series rather *purpurascens*. long; retinaculum a large flattened plate. Distinct in shape, especially in the crenulate margin of the hindwing. The dull purple-clouded forewing and rosy hindwing render confusion with any other Palearctic species impossible. Ichang and Mou-pin. Also known to me from Birma.

25. Genus: **Petelia** H.-Schäff.

Face slightly rough-scaled. Palpus strong, moderate to long. Antenna long, in ♂ bipectinate, with apical part simple. Pectus densely hairy. Wings strong, the scaling thick. Forewing with the 2nd—5th subcostals stalked, the 2nd usually arising far beyond the 5th. Hindwing with distal margin commonly undulate or slightly bent in the middle.

The most typical species are Indo-Australian, but representatives are found in the Eastern Palearctic Region, E. Africa and S. America.

Distinct from *Cabera* in the stronger palpus, from *Synegia* in the shorter legs, etc.; from both in the robuster build, rougher clothing and dark coloration.

A. Hindwing of ♂ with basal fovea (*Alana* Walk.).

P. albifrontaria Leech (15 h). Rather longer-winged than the species of Section B, lighter coloured, *albifrontaria*. both wings with small but distinctly white-pupilled cell-spot, the distal area of the forewing with characteristic pale grey, dark-dusted spots. Japan: Gifu.

B. Hindwing of ♂ without fovea (*Petelia*).

P. rivulosa Btlr. (15 h). A large species, the ground-colour marked with innumerable small darker *rivulosa*. strigulae which in many places tend to arrange themselves in transverse lines. Forewing with thick curved antemedian line, both wings with rather straight, thick median line, placed rather near the base on account of the short cells; a greyer distal area is bounded proximally by a vague, sinuous dark shade. Japan: Tokyo, etc.

P. morosa Btlr. has all the markings very confused excepting a small grey apical patch; proximally *morosa*. to this and often extending nearly across the wing, though narrowing rapidly, is a rust-reddish cloud; basal area of forewing also much more reddish than median area. Japan: Tokyo, etc.

26. Genus: **Hypephyra** Btlr.

Face with projecting tuft of scales. Palpus well developed. Antenna in ♂ simply ciliated. Hindtibia in ♂ with hair-pencil. Wings ample, thickly scaled. Forewing with apex acute; 1st and 2nd subcostals stalked, the 1st anastomosing with costal.

India, Japan, etc.

The characters given above are taken from the type species (*terrosa*) and *pryeraria*; I have not yet worked out the limits of the genus.

H. terrosa Btlr. (25 a). Somewhat larger and decidedly darker than *pryeraria*, being suffused with *terrosa*. dark violet-grey, especially in the distal area; forewing with an elongate black cell-mark surrounded at a short distance by a slender dark ring; hindwing with a crenulate pale subterminal line. Underside pale ochreous, distal area more reddish, containing a dark patch in posterior half of forewing. N. W. Himalayas, W. and Central China, Japan.

H. pryeraria Leech (25 a) lacks the characteristic cell-mark of the forewing and the subterminal line of *pryeraria*. the hindwing and has the underside almost unicolorous. Gifu.

H. flavimaculata Leech (15 g). Placed here in the British Museum collection, but the face is not tufted *flavimaculata*. and the first 2 subcostals of the forewing are coincident; affinities quite uncertain. Recognizable at a glance by the large yellowish apical patch. Central and W. China.

27. Genus: **Hyperythra** *Guen.*

Face smooth, with a slight tuft at lower extremity. Palpus rather long. Antenna in ♂ bipectinate. Pectus hairy. Forewing in ♂ with fovea; 1st subcostal free, 2nd stalked with 3rd—4th, usually arising just beyond 5th. Hindwing with distal margin crenulate, commonly somewhat cut away at apex; cell extremely short; costal margin in ♂ greatly expanded, a strong tuft of hairs arising from base of cell and lying in a groove along upper surface anteriorly to the cell.

Indo-Australian. All the species are very closely related, if not races of a single very variable species.

lutea. **H. lutea** *Stoll* (= *flavaria* *F.*, *limbolaria* *Guen.*), founded on a ♀ from Java, but widely distributed throughout India, etc., has been taken at Dharmasala, but can scarcely be regarded as a Palearctic species. It is very variable, the ♀ bright yellow, the ♂ strongly suffused with pink and more mixed with fuscous, altogether much more variegated. — *ennomaria* *Guen.* (19 c) is distinguished by its much more uniform pinkish brown ground-colour, both surface in the ♂ almost entirely without yellow admixture, the ♀ showing some yellowish beneath. The underside shows a conspicuous triangular whitish patch on distal margin close to the apex of the forewing, which is less well defined in the name-type. Dharmasala, etc.

28. Genus: **Syrrhodia** *Hbn.*

Very closely akin to *Hyperythra*, but without the abnormally short cells, expanded costal margin and long hair-pencil. The secondary sexual modifications vary in different groups and are sometimes very slight. The only species included in the present volume forms the type of the section *Tycoonina* *Warr.*, the ♂ with a small patch of hair on the upperside of the forewing, placed on the fold at about one-fourth from the base. The genus is widely distributed — India, Africa, S. America.

obliqua. **S. obliqua** *Warr.* is very closely like the Indian *phoenix* *Swinh.* (figured in Vol. XII). The ♂ can be distinguished by the scent-patch on the forewing. The postmedian line of the forewing is remarkably straight, the median line more slender than in *phoenix* and slightly oblique, thus nearer to the postmedian at the costal than at the posterior margin; dark apical spots of hindwing weak and diffuse. Described from „Japan“. I have before me 2 ♂♂ from Omei-shan and a ♀ from Kwei-chow.

29. Genus: **Anagoga** *Hbn.*

Face somewhat protuberant below, shortly rough-scaled. Palpus moderate, rough-scaled. Antenna in ♂ bipectinate, with rather long branches. Forewing rather elongate, apex pointed; fovea wanting; 1st subcostal anastomosing or connected with costal; 2nd arising from 3rd—5th, or rarely from 1st, anastomosing with 1st. Hindwing moderately rounded, costal approximated to cell to one-half, 2nd subcostal often from end of cell or even very shortly stalked.

Larva elongate, twig-like, the head cordiform, the 5th abdominal segment with a strong transverse protuberance, the 6th with smaller protuberances.

A small genus, chiefly (perhaps exclusively) Palearctic and Nearctic.

pulveraria. **A. pulveraria** *L.* (= *diffusaria* *Walk.*) (15 h). Variable, but always showing more or less of a reddish tone, with no markings except the rather straight antemedian and posteriorly strongly incurved postmedian lines of the forewing. The median area in the name-typical form is darkened. — ab. *passetii* *Th.-Mieg* (= *saturaria* *Wagner*) is violaceous grey instead of reddish brown, the median band sharply expressed. — ab. *marginipurpuraria* *Bastelb.* (25 a) is deeper red, the median area of forewing and basal half of hindwing more orange, the rest more purple-tinged, lines thick, antemedian rather curved, postmedian less broad anteriorly than in the type. Rather small and round-winged. Rheingau. — ab. *unicolor* *Hirschke* has both wings uniform brown, dark-dusted, without lines or band. — *gadmensis* *RÄTZER* is a rather small, brighter (yellowish) brown form from Switzerland (Gadmenthal), with the median area almost or quite concolorous, the lines remaining. — *violacearia* *Graeser* (15 h), from Amurland, is a very small form, coloured nearly like *marginipurpuraria*, which must perhaps sink to it, but the thick lines are described as dark violet and it is not indicated that their form differs from the normal; compare, however, the following form. — *japonica* *Btlr.* (= *violacearia* *Herz*, ? *Graeser*) is a small race, or possibly distinct species, from Japan and Korea, bright deep red-brown, the median area as broad posteriorly as anteriorly, not differentiated in colour, the lines which bound it deeper red brown, the postmedian only projecting a little in the middle. Line on hindwing continued nearly to the costal margin, straighter than in *marginipurpuraria*, which also shows this peculiarity. — Egg dark red throughout, or with more or less confluent dark red spots, the reticulation very fine and shallow. Larva reddish brown or purplish grey, mottled with yellowish brown; on birch, oak, willow, etc. The pupa hibernates and is rather elongate, red-brown. *pulveraria* flies in April—June, a partial 2nd brood in July—August. It has a wide distribution in Central and N. Europe, Siberia, etc.

30. Genus: **Püngeleria** Rougemont.

Characters of *Anagoga* but with the face flat, antennal pectinations more slender and straighter, abdomen and wings rather more slender, forewing with 2nd subcostal anastomosing or connected with 3rd-4th.

Larva elongate, smooth, not twig-like, bearing, like *Ellopiia*, an additional (rudimentary) pair of legs on the 5th abdominal segment; head large and flat. Thus quite remote from that of the preceding genus.

P. capreolaria Schiff. (15 h). Duller coloured than *A. pulveraria*, forewing with a conspicuous black capreolaria. cell-dot, antemedian line bent basewards at costa, postmedian more dentate, the enclosed area broad. — ab. **donzelaria** Dup. is yellow whitish, with the lines and cell dot black. From the mountains of Central France donzelaria. and Italy. — **valesiaria** Vorbr. & Müll.-Rutz is almost unicolorous grey, not brownish. Valais. — Larva green valesiaria. with longitudinal blue-green subdorsal and yellow lateral stripes. On Pinus abies (Abies excelsa), hibernating small. Local, Central—S. E. Europe, flying in July.

P. castiliaria Stgr. is unknown to me, perphas not congeneric. Palpus somewhat shorter. Fore-castiliaria. wing narrow, with more rounded apex. Dirty yellowish grey or ash-grey with dark cell-streak and extremely weak lines at one-third and three-fourths. Hindwing lighter, weakly irrorated distally. Castile.

31. Genus: **Ephoria** Meyr.

Face prominent, with somewhat projecting scales. Palpus moderate, rough-scaled. Antenna in ♂ very shortly pectinate. Femora hairy. Forewing without fovea; 2nd subcostal stalked with 3rd—5th. Hind wing with costal approximated to cell to one-half. Contains only a single species.

E. arenosa Btlr. (25 b) is a striking species, bright ochreous with the broad dark lines of the forewing arenosa. coalescing near the posterior margin, the apical area of both wings deep fuscous, that of the forewing relieved with pure white spots. Japan and S. E. Siberia.

32. Genus: **Proteostrenia** Warr.

Face with appressed scales. Palpus rather short. Antenna in ♂ bipectinate. Forewing (especially in the ♀) with apex acute, a slight excision behind it; fovea present in ♂; 1st—2nd subcostal vein coincident. Hindwing with distal margin crenulate, discocellulars rather strongly bent.

A Japanese genus, remarkable for its great sexual dimorphism.

P. leda Btlr. (15 h). Extraordinarily variable, especially the ♀. The name-type, and also the commo- leda. nest ♂ form, is black, with white subapical patch at costal margin of forewing and smaller one (sometimes double) at distal margin. — ♀-f. **strenioides** Btlr. is the first described ♀. Yellowish white, with more ochreous strenioides. clouding in places, thick blackish subbasal antemedian and postmedian lines (the last-named double) and broad dark longitudinal streaks giving it a latticed appearance. — ♀-f. **lachrymosa** Btlr. is more clouded with lachrymosa. dark brownish, leaving whitish spots corresponding to those of the ♂ and indefinite broken lines or bands of whitish spots. — ♀-f. **oberthürrii** Btlr. (15 h) has only the principal dark lines and a dark irroration. — oberthürrii. ♀-f. **ossea** Btlr. is similar to the preceding, but almost without irroration, the postmedian line strong, markedly ossea. denticulate. — ♀-f. **straminea** Btlr. is a very extreme aberration with dark markings only remaining at straminea. costal margin and apex of forewing and at the branching of the 3rd radial and 1st median. — All the forms occur in Japan. Also known from Central and W. China.

P. pica Wileman (15 h), founded on a single ♀ from Yamato, Japan, is smaller and appears rela- pica. tively narrower-winged; distal margins smoother. Yellow-whitish, forewing with broad, posteriorly coalescent antemedian and median dark brown bands, a narrow outer band of the same and dark brown veins; hindwing similar but with proximal half dark. — **atrata** Wileman, taken at the same locality, is probably the atrata. ♂ to pica. Black, with a white dash on costa of forewing near the apex and a white dot at the apex.

33. Genus: **Scardamia** Guen.

Face with short projecting tuft. Palpus moderate. Antenna in ♂ bipectinate. Abdomen with a small metallic crest near base. Wings smooth-margined. Forewing without fovea; first two subcostals stalked, the 1st anastomosing with costal.

A small and very natural genus, chiefly Indo-Australian and African. All the species are bright orange coloured, with metallic lines.

S. aurantiacaria Brem. (15 i) is distinguished by its very oblique antemedian line, rather strong auranti- and coarse dark dusting and rather weakly marked underside. Distributed in E. Siberia, China, Japan etc. acaria.

S. obliquaria Leech (15 i) has the antemedian line bent, the postmedian oblique from near the apex. obliquaria. Ground-colour lighter, the distal area somewhat darkened. Korea.

34. Genus: **Pseudothalera** Warr.

Unknown to me, as I have not been able to find WARRENS type; probably near the Indo-Australian genus *Aplochloa*. Palpus porrect, with 3rd joint minute. Antenna in ♂ simple. Legs long. Forewing with apex acute, distal margin decidedly oblique, scarcely curved; 1st subcostal free, 2nd—5th stalked. Hindwing quadrate, distal margin slightly crenulate anteriorly, a slight angle at 3rd radial, thence straight to anal angle.

stigmatica. **Ps. stigmatica** ⁵/₃ Warr. 40 mm. Pale dull ochreous green, finely dusted with olive; costa of forewing thickly spotted with fuscous, cellspot small, black, an indistinct olive-fuscous line at seven-eighths, more distinct at hindmargin; hindwing with a large round blackish cellspot followed by a slightly angulated pale olive line. W. China.

35. Genus: **Ellopia** Tr.

Face smooth. Palpus short and slender. Antenna in ♂ bipectinate. Wings smooth-margined. Forewing without fovea; 2nd subcostal stalked with 3rd—5th. — Larva of moderate proportions, with pairs of minute dorsal protuberances, a pair of rudimentary legs on the 5th abdominal segment. Geographical distribution: Palearctic.

fasciaria. **E. fasciaria** L. (= *prosapiaria* L., *rufofasciosa* Esp.) (15 i). LINNÉ twice described this species; first a worn, greyish red form, then on the following page (as *prosapiaria*) a brighter red example. Both forms show the 2 curved lines of the forewing and 1 on the hindwing. — ab. *grisearia* Fuchs differs little from LINNÉ's first type, but is still greyer. Frequent in Scotland. Also recorded from Germany and Austria. — ab. *manitaria* H.-Sch. is of a uniform dark liver-colour with the lines obliterated. — ab. *cinereostri-garia* Klem. has the lines dark grey instead of white. The type specimens (♀) were also narrow-winged. — ab. *ochrearia* Joan. (= *ochracearia* Rbl.) is clear ochreous, nearly as in *Ennomos erosaria*. — ab. *intermediaria* Gmpbg. is a transitional form, green with red costal margin, fringes, and edging to the lines. — *prasinaria* Schiff. (= *viridifasciosa* Esp.) (15 i) is an interesting green form with the white lines usually well-developed and is common in some localities, the larva feeding on pines and spruce fir, while that of typical *fasciaria* feeds on Scotch fir. — ab. *extincta* Vorbr. & Müll.-Rutz is a modification of *prasinaria*, darker green with the white lines almost or entirely obsolete. — Egg approximately oval, somewhat flattened at the ends, the micropylar end broader; reticulation very slight; colour red. Larve red or red-brown, assimilating to the colour of the sheaths of the pine-needles, dorsum with darker triangles. On *Pinus sylvestris*, hibernating small. Moth in June—August. Central and N. Europe, Ural, Caucasus, Altai and E. Siberia.

pinicolaria. **E. pinicolaria** Bell. (25 b). Near *prasinaria*, forewing more acute, colour more glaucous green, the lines running only from inner margin to about two-thirds, the antemedian very oblique. Inhabits the mountains of Corsica, in forests of larch; 1 ♀ has been recorded from the Taurus.

compararia. **E. compararia** Stgr. (2 f) differs from *prasinaria* in the extremely slender, rather differently placed lines, as well as in its smaller size and duller colour. The distal margin of the hindwing shows in the middle a slight bend which is not or scarcely appreciable in *fasciaria* and its forms. Only known from Algeria.

squalidaria. **E. (?) squalidaria** Costa, described as a *Hemithea* but compared with *prasinaria*, may well belong here. Size of *compararia*, forewing rather more rounded, hindwing not bent at 3rd radial, ground-colour yellow (possibly faded), the lines not quite so fine as in *compararia*, antemedian straight, postmedian of forewing very gently sinuous, of hindwing forming a strong curve. S. Italy: S. Cataldo, near Lecce; Patria, near Naples. In July.

duponti. **E. (?) duponti** Mab. is unknown to me and I much doubt its belonging to this genus. The build (according to the figure) recalls *Enconista miniosata* (23 l) ground-colour similar, discal mark more slender, rosy antemedian and postmedian bands present on the forewing, hindwing whitish, tinged with rosy distally, a fine transverse line running across the middle to the vicinity of the anal angle. Spain: La Granja.

36. Genus: **Campaea** Lam.

Nearly related to *Ellopia*, differing chiefly in the shape of the wings. Both wings show a more or less strong angular projection at the 3rd radial and the distal margin of the hindwing (sometimes also the forewing) is somewhat crenulate throughout. — Larva with an additional pair of legs on the 5th abdominal segment and flattened ventral surface, and with fleshy lateral processes which enable it to fit more closely to the twig on which it rests — a beautiful protective adaptation seen also in *Gastropacha* and other larvae. Geographical range: Palearctic, Nearctic and perhaps Indian.

O. margaritata L. (= *sesquistriataria* Knoch) (15 i). Distal margin of forewing not, of hindwing *margaritata*. only slightly crenulate. Delicate light green when fresh, the colour exceedingly fugitive. Egg smooth, long-oval, but laid with the micropyle at the top; light grey, dark-dotted, later pink with the dots deep red. Larva grey, brown or brownish-green, commonly with whitish dots, segment-incisions well marked. On birch, oak and many other trees, hibernating. Imago in June—July, rarely (small specimens) again in September. Central Europe to Transcaucasia.

C. honoraria Schiff. (= *ilicaria* Nill., *excisaria* Esp., *honorifica* Esp.) (15 i). Margins more strongly *honoraria*. crenulate, colour normally light brown or more reddish brown, both wings with a small discal dot. — ab. **pictavorum** Ob. has the lines of the forewing approximated, meeting at the hindmargin. — ab. **virescens** D. Luc. *pictavorum*. *virescens*. has the wings greenish throughout. — Egg nearly round, at first cream-colour, afterwards spotted with blood-red. Larva reddish grey, with the dark dorsal line much interrupted, a small dark hump on the 7th abdominal segment; spiracles large, white, ringed with black. On oak, hibernating. *honoraria* is local in S. Europe, Holland and Belgium, N. Africa etc., May and July.

37. Genus: **Ennomos** Tr.

Face obliquely prominent, with dense projecting scales. Palpus moderate or longish, rough-haired. Antenna in ♂ bipectinate; in ♀ very shortly bipectinate or serrate. Breast and femora densely hairy; tibiae sometimes strongly hairy. Hindtibia with median spurs short or wanting. Wing-margins irregular, both wings prominent at 3rd radial, forewing generally somewhat excised behind this vein. Fovea wanting. Neuration variable, all the subcostals usually present. Egg at one end rounded (subgenus *Ennomos*) or squared (*Deuteronomos*), the micropylar end with a white ring; mostly laid in lines side by side. Hibernating. Larva when first hatched smooth and slender, becoming twig-like, with transverse humps, especially on the 2nd and 5th abdominal segments. Pupa somewhat rugose, a surface coating being covered with a network of fine lines and pitting; cremaster long, with strong spines. In a silken cocoon. The moths resemble autumn leaves, fly at night and are attracted by light. Palearctic (chiefly European) and Nearctic.

Subgenus *Ennomos* Tr. Tongue present, though short. Hindtibia with median spurs.

E. autumnaria Wrbng. (= *alniaria* Schiff. nec L.) (15 k). Considerably the largest European *Enno-autumnaria*. *mos* and further characterized by the coarse dots which are spread over the wings, though very variable in intensity. — ab. **schultzi** Siebert has both wings entirely infuscated, merely the veins and perhaps the extreme *schultzi*. base and on the hindwing the inner margin remaining undarkened. Known from Germany and England. — Egg olive-green, becoming deep chocolate brown, micropyle black; pitting very slight, longitudinally arranged. Larva dark brown, irregularly streaked and mottled with more reddish brown; a transverse protuberance on the 2nd abdominal segment, a smaller on the 5th, lateral projections on the 3rd. On various trees. Pupa with a purplish bloom; firmly attached in a slight cocoon. Moth in August—September. Europe, E. Siberia and Japan. — hybr. **dartfordi** Tutt is the product of crossing ♂ *autumnaria* with ♀ *quercinaria*. Intermediate *dartfordi*. in size, shape of forewing suggesting *autumnaria*, of hindwing *quercinaria*, forewing mottled as in the former, but with distinct lines as in the latter.

E. quercinaria Hufn. (15 k). Extremely variable, but distinguishable from the species of the subgenus *quercinaria*. *Deuteronomos* by the structure, the wing-shape, the form of the antemedian line etc. The name-typical form is light yellowish, with the lines not accompanied by dark shades. — ab. **equestraria** F. (= *infuscata* Stgr.) *equestraria*. (15 k) has the median area normal, the proximal and distal infuscated. — ab. **perfuscata** ab. nov. has both wings *perfuscata*. entirely infuscated. — ab. **carpinaria** Hbn. is of a more reddish ochreous colour. — ab. **angularia** Hbn. has *carpinaria*. *angularia*. some strong dark shading distally to the postmedian line. — Many other forms occur, which have not received separate names. Larva elongate, with less strong humps than some species, occasionally smooth-always so in its younger stages; brown mottled with reddish, or more uniform green. On oak, beech, birch, lime etc., full fed about the end of June. Pupa greenish, the wings more yellow. The moth flies in August—September and is fairly common in Central Europe, occurring also in the Taurus and Transcaucasia.

Subgenus (? Genus) *Deuteronomos*, subg. nov. Tongue wanting or absolutely vestigial. Hindtibia without median spurs.

E. alniaria L. (= *canaria* Hbn., *tiliaria* Bkh.) (15 k). Best distinguished by the bright canary-yellow *alniaria*. thorax and by the conspicuous discal spots. Not very variable. — Egg brick-shaped, with a depression on upper surface; strongly polished, blackish. Larva very elongate, slender anteriorly, hump on 2nd abdominal well developed; brown, mottled with purplish above, more greenish below. Feeds chiefly on birch and alder. Pupa in a tough cocoon among fallen leaves, moss or grass. Moth in August and September. Central Europe, S. France, N. Italy, Scandinavia and parts of Russia.

fuscantaria. **E. fuscantaria** Steph. (= *carpinaria* Haw. nec Hbn.) (15 k). Distinguished by its less bright colour *effuscaria*. and especially by the smoky suffusion of the distal area. — Only in ab. **effuscaria** Rbl., from Transsylvania, *destrigaria*. this distal infuscation is almost entirely wanting. — ab. **destrigaria** Galvagni lacks both the transverses lines. — *perfuscaria*. ab. **perfuscaria** Rbl. has the dark suffusion equally diffused throughout the wings, forewing with the lines strong — Larva green, more or less marked with brown, occasionally reddish grey with slight green mottling; hump not very large, sometimes wanting. On ash, in captivity accepting privet. Pupa in a strong but open silken network among leaves or the herbage beneath the tree. Moth in August—September. Local in Central Europe, Southern Scandinavia, Livonia.

effractaria. **E. effractaria** Frr., founded on a ♂ bred from an undescribed larva taken on alder at Sarepta, is an enigmatical species. Very near *alniaria*, but with the margins scarcely so irregular (intermediate towards *quercinaria*), the lines of the forewing nearly meeting on the hindmargin, the postmedian followed by some slight dark shading; cell-spot large; fringes with larger but less darkly coloured spots; hindwing with a line formed nearly as in *fuscantaria*; underside about as in the most strongly marked *alniaria*. But for the apparent absence of bright yellow hair on thorax, I should refer it as an aberration to that species.

erosaria. **E. erosaria** Schiff. (15 k). This species and the following are in general recognizable by their freedom from dark dusting; even the lightest *quercinaria* are generally somewhat dusted, or at least appreciably darkened on the veins and distal margin. *erosaria* has the head and thorax yellowish, but less bright than in *alniaria*, lines rather less oblique, postmedian further from distal margin, antemedian strongly inclined basewards *tiliaria*. at costa; cell-spot obsolete above. The nametypical form is yellowish. — ab. **tiliaria** Hbn. is paler, the *unicoloria*. forewing straw-colour. — ab. **unicoloria** Esp. is without the transverse lines. — Larva rather elongate, with strong knob-shaped protuberances, altogether bearing a remarkable likeness to an oak twig; brown, now with a tinge of purple, now of greenish, ventral surface paler greenish brown. On oak. Pupa in an open silken network among leaves. The imago appears in August and September and inhabits Central and parts of S. W. and E. Europe and Transcaucasia.

quercaria. **E. quercaria** Hbn. (= *dryadaria* Rbr.) (15 k). Similar in colour to the preceding or slightly less yellow, the lines of the forewing parallel, accompanied on the reverse sides by fine whitish lines, cell-spot above present or absent, underside with pale yellowish postmedian line, often edged proximally with a dark line. The larva is similar to that of *erosaria*, but of a paler yellowish brown colour. It is said to feed exclusively on oak. The perfect insect appears in August—September. Local, Spain, S. E. Europe, Asia Minor, Transcaucasia.

38. Genus: **Eumera** Stgr.

Face rounded-prominent with appressed scales. Palpus extremely short. Tongue wanting. Forewing without special prominence at 3rd radial. Other characters nearly as in *Ennomos*. The ♀ antenna is shortly pectinate. All spurs present, but short. Erected by STAUDINGER for a single Palearctic species.

regina. **E. regina** Stgr. (15 k) may be known by its shape and by the round white dots which succeed the distal shading of the postmedian line between 3rd radial and 2nd median (the posterior one sometimes obsolete). Underside similar to upper. Dalmatia, the Amasia district and Palestina.

39. Genus: **Selenia** Hbn.

Face with projecting tuft of scales. Palpus moderate, rough-scaled. Antenna in ♂ bipectinate, in ♀ serrate or subpectinate. Femora densely hairy. Hindtibia with all spurs. Forewing without fovea; a transparent discocellular mark; 1st and 2nd subcostals generally free; 1st radial from stalk of 3rd—5th subcostal; distal margin strongly prominent at 3rd radial, somewhat concave behind. Hindwing with distal margin irregularly crenulate; cell-mark as on forewing; 2nd subcostal stalked or from a point with 1st radial; vestiges of 2nd radial persist. — Larva when newly hatched stouter, more *Biston*-like than that of *Ennomos*. Adult larva also stouter, swollen posteriorly, knotted, the 3rd pair of legs swollen at the base, larger than the others. Pupa stout, smooth, in a stronger cocoon than *Ennomos*, among dead leaves or moss or just below the ground; hibernating. The moth sits with the wings raised and is very leaf-like. Range Palearctic.

bilunaria. **S. bilunaria** Esp. (= *illunaria* Hbn.) (16 a). Distinguished by the less deep excision between the radials of the hindwing, less rich colouring, enlarged costal spots at the origin of the lines, median area not differentiated in colour from distal area, transparent discal marks not well developed. The spring form is large, *infuscata*. strongly irrorated with fuscous, sometimes more olivaceous. — ab. **infuscata** Strand has the space between

the median and postmedian lines darkened into a band. — *illunaria* *Esp.* (= *juliania* *Haw.*, *aestivalis* *illunaria* *Guen.*) (16 a) is the summer generation, much smaller and much less irrorated. Sometimes pale, sometimes warmer brown. — ab. *minima* *Strand* is a dwarfed form, sometimes sharply marked, frequent in Arctic, *minima*. Norway. — Egg red, somewhat glossy, with very weak reticulation. Larva orange-brown or reddish brown, sometimes inclining to purplish; meso- and metathorax enlarged laterally, 4th—5th abdominal swollen, with small dorsal humps; anterior segments marked with bright orange. On various trees and shrubs, in two generations. Moth in March—April and again in July. Distributed in Europe, Transcaucasia, E. Siberia. — *parvilunaria* *Bartel* is a hybrid between *bilunaria* ♂ and *tetralunaria* ♀, with the discal lunules of the upper surface very small. *parvilunaria*.

S. hypomelatharia *Ob.* differs in its enormous size (length of a forewing in the ♀ 35 mm) and in *hypomelatharia* having 2 distinct lines on the hindwing above and beneath, the postmedian dentate. Ta-chien-lu.

S. lunaria *Schiff.* (= *lunularia* *Hbn.*) (16 a). Antemedian lines of forewing strongly curved, postmedian *lunaria*. almost straight, oblique outwards, median area very much wider posteriorly than anteriorly, wholly or in part dark-shaded. — ab. *sublunaria* *Steph.* is much darker and more purple, almost exactly the colour of some *sublunaria*. *tetralunaria*. — *delunaria* *Hbn.* (16 a), the 2nd generation, is on an average rather smaller and with less irroration, but differs less from the 1st brood than in the other species. — Larva more than usually humped, metathorax much swollen beneath, with the legs placed on a projecting pad; variable in colour, grey-brown, purplebrown, red-brown or brownish green, more or less mottled. Duration of this stage irregular. Moth in May and June, a partial 2nd generation in August. Distributed in Europe, except Iberia and Greece; also in Asia Minor, Armenia, Issyk-kul. *delunaria*.

S. tetralunaria *Hufn.* (= *quadrilunaria* *Esp.*, *illustraria* *Hbn.*, *phoebearia* *Schr.*) (16 a). Characterized *tetralunaria*. by the sinuous postmedian line, large cell-marks, etc. The spring brood is predominantly shaded with deep purplish above and beneath. — ab. *kühnei* *Kühne* is violaceous rosered, without the irroration of the name- *kühnei*. typical form. — gen. aest. *aestiva* *Stgr.* (16 a) is smaller, lighter, more reddish, on the underside of the hind- *aestiva*. wing more inclining to orange. — Larva in general purplish brown, with grey and dark marblings; 1st and 2nd abdominals with bifid humps, 4th—5th much swollen, with smaller, partly black-marked humps, the incision between them pale. On various trees and shrubs, in two generations. Moth in April—May and again in July—August, distributed in Europe, Transcaucasia and Siberia to Japan.

S. pallidaria *Leech* (16 a) is coloured about like *bilunaria* f. *illunaria* (16 a) and of the same size, *pallidaria*. but the postmedian line is much more distally placed, running to the anal angle; median shade obsolete, except as a vague diffuse shade distally to the cell. Underside not variegated, forewing with postmedian line, hindwing with median. Yesso, 1 ♀.

S. adustaria *Leech* (16 a). Wing-margins rather less uneven than in *bilunaria*, outer line as in *palli-* *adustaria*. *daria* but rather more sinuous, median shade distinct throughout, sinuous, oblique outwards. Underside varied with brighter golden-brown and pinkish white. — ab. *fusca* *Leech* is much smaller, the upperside fuscous, *fusca*. weakly marked. Yesso.

S. sordidaria *Leech*. Shape of the 2 preceding, colour and markings of *bilunaria*, postmedian line nearly *sordidaria*. parallel with termen, well developed also in middle of hindwing, incurved between radials. Minute black discal dots present. Ichang, only a single worn ♂ known.

40. Genus: *Phalaena* L.

Characters of *Selenia* but with the distal margin of forewing projecting less in the middle, cell longer, 1st radial vein at its origin remote from the subcostals, also in the hindwing not stalked; generally no transparent marks on the discocellulars. — Larva short and thick, with a pair of dorsal humps on the 2nd abdominal and a smaller pair on the 3rd followed by a remarkable pair of long thin, recurved fleshy processes with hook-like tips. Pupa short, rugose, very thick and almost humped in the middle; suspended in a network cocoon. The genus is Palearctic and perhaps Indian.

P. syringaria L. (16 b). Both surfaces very variegated, the only sharply defined dark markings being *syringaria*. the median line and on the forewing a portion of the postmedian, from an acute angle at the 5th subcostal about to the 3rd radial. On the under surface the median line of the forewing follows a more normal course than above. — ab. *hofmanni* *Schreiber* has both wings strongly darkened in the distal area (from *hofmanni*. the median line), the nervures and fringes deep black. — *helvolaria* *Robs. & Gardn.* is a smaller, paler 2nd *helvolaria*. brood form. — Larva very variable, commonly ochreous brown, much variegated, some dark dorsal markings, subdorsal region often pale, with some whitish admixture. On honeysuckle, privet and lilac, hiber-

nating. Pupa strongly and irregularly sculptured; dark chestnut colour, paler at the incisions, cremaster black. *syringaria* is distributed in Central Europe and probably in Central Asia and also occurs in Japan; June—July.

marmorata-ria. **P. marmorataria** *Leech* (16 c). Distal margins less crenulate, approaching the form of *Garaeus parva* but preserving the excision behind the apex. Coloration quite different from that of *syringaria*, whitish, brown and rust-colour, with a slight admixture of olive-grey. Antemedian olivaceous line very acutely angled subcostally; postmedian line more strongly and uniformly developed than in *syringaria*, gently incurved between 1st radial and 1st median. Central China: Chang Yang.

productaria. **P. productaria** *Leech* (16 b). The shape and scheme of markings suggest a doubt whether this and the remaining species will prove biologically to belong here. *productaria* is easily distinguished by the very long projection of the median area between the 2nd and 3rd radials of the forewing. Underside yellower, with an almost straight dark postmedian line. W. China: Wa-shan.

crenularia. **P. crenularia** *Leech*. Closely similar to *productaria*, vertex of head pure white, wings above more purplish brown, cell marks weak and lunulate, not black and roundish, postmedian line of forewing much less projecting, underside rather paler. Omei-shan.

viridescens. **P. viridescens** *Warr.* (= *olivaria* *Leech*) (16 b). Slightly variable in colour, sometimes with a more olivaceous tinge, but not likely to be confused with any other Palearctic species. Underside yellow with some violet-grey suffusion in distal area. Mou-pin, indistinguishable from the Indian form.

latimarginaria. **P. latimarginaria** *Leech* (16 b) differs in the distribution of its colouring and especially in the irregular course of the postmedian line. Underside ochreous, not pure yellow. Chang Yang and Mou-pin.

acuminaria. **P. acuminaria** *Leech* (16 b), described as *Crocallis* (?), may be provisionally placed here. Recognizably by its shape, the straight antemedian line, white costal spot distally to the postmedian etc. W. China: Che-tou, only the ♀ known.

variaria. **P. variaria** *Leech* (16 b) will in any case require generic separation. Palpus long. Forewing with 1st and 2nd subcostale long stalked. Hindwing extremely dentate, the long tooth at the 2nd subcostal recalling *Prionodonta*. The arrangement of the markings can be seen from our figure. Underside similarly marked. W. China: Chia-ting-fu.

41. Genus: **Garaeus** *Moore*.

Agrees in structure with *Phalaena* except that the eye is hairy, the ♀ antenna rarely pectinate. The wings are on an average somewhat narrower, with more oblique distal margin of forewing, and on the whole they are less strongly crenulate. Some of the species are rather robust in build. The only known larva (that of *parva*) shows an important structural distinction from *Phalaena*; it has paired dorsal warts on the 3rd—5th abdominal segments but lacks the long hooked processes. An Indian genus, but extending to Japan and Formosa.

A. Antennae in ♀ bipectinate.

parva. **G. parva** *Hedem.* (= *distans* *Warr.*) Extraordinarily like *syringaria*, on an average smaller; distal margin of forewing nearly smooth, of hindwing less excised between the radials. Colouring sometimes more suffused with greyish; postmedian line of forewing throughout parallel with (and approximated to) the median line, but represented only, except from costal margin to the angle, by vein-dots. A black discal dot present (*nigrilineata*, sometimes slight). Japan and Amurland. — **nigrilineata** *form. nov.*, from Omei-shan, has the median line strong, blackish, discal dot very conspicuous, somewhat enlarged. — **discolor** *Warr.* is often still smaller, is more strongly (sometimes almost entirely) suffused with olive-grey and has the median line on an average more proximally placed, its angle not, or scarcely, reaching beyond the discal dot. Kiushiu and Ichang. Also in Assam. The larva of *parva* feeds on *Ligustrum ibota*, the perfect insect appearing in July.

mirandus. **G. mirandus** *Btlr.* (17 b). A strikingly distinct species. Both sexes nearly alike in the pattern, but the ♂ is black with white spots, the ♀ yellowish brown. Japan. Systematic position uncertain; fovea present in the ♂.

B. Antennae in ♀ serrate (*Garaeus*).

specularis. **G. specularis** *Moore* is a North Indian species which will be described in vol. 12. Though variable, it is generally recognizable by the colour and by the hyaline spots. Some Chang Yang examples resemble *fenestratus*. — **fenestratus** *Btlr.* (16 b) as *specularis* represents *specularis* in Central China, Korea and Japan. The forewing has a small (in *specularis* large) black discal dot, the dark clouding in the distal area is commonly stronger, the dark subterminal line more diffuse, the hyaline patch in the cell of the hindwing more broken into

separate spots. — ab. (?) *mactans* *Btlr.* has the ground-colour rather uniform reddish, the hyaline spots wanting on the forewing, reduced or wanting on the hindwing, distal area still more strongly grey clouded. Japan: Yokohama and Chusendji.

G. albipunctatus *Hmps.* differs in having the wings strongly suffused with purple-grey excepting the part of the forewing which lies between the subcostal and median veins and their continuations; characteristic is a white dot or small spot near the apex; the hindwing has an irregular band of somewhat hyaline dots or small spots from middle of discocellulars to inner margin beyond middle. Dharmasala.

G. apicata *Moore.* Distal margins not crenulate; apex of forewing strongly produced, especially in the ♀. Duller in colour, sometimes olivaceous, postmedian line of forewing double or triple, its outer constituent running to the apex, its continuation on hindwing ending in some irregular, thick dark markings, proximally to which stands a variable row of hyaline spots. N. India, including Dharmasala. Also on Formosa.

G. argillacea *Btlr.* (25 b). Shape of *apicata*, much more simply marked, both wings with discal dot and dark chestnut, proximally pale-edged, oblique line, forewing also with indistinct antemedian. Dharmasala; W. China.

G. signata *Btlr.* (16 b). This species (the type of BUTLERS genus *Epifidonia*) and the two which follow are perhaps on an average broader winged than the preceding group, the abdomen rather slender, the hindwing without hyaline spots, the underside rather bright orange-yellow. *signata* is characterized by a white spot on the forewing, placed as in the quite differently coloured *albipunctatus* but much larger. Some examples are much more heavily dusted with fuscous than others. N. W. Himalayas.

G. lateritiaria *Pouj.* (= *laterinata* *Pouj.*). Palpus elongata. Costal margin of forewing more arched, distal margin of both wings smoother. No white spot on forewing. The wings concolorous, with two slender lines from apex of forewing to middle of inner margin of hindwing, separated only by a whitish thread. Under surface with a dark postmedian line, a dark spot in middle of distal margin and another in middle of hindmargin of forewing. W. China: Mou-pin and Huang-mu-chang.

G. virilis *sp. nov.* (16 b). Eye rather small; palpus long, with 3rd joint elongate; forewing with 1st subcostal anastomosing at a point with costal. In shape nearest *lateritiaria*, colours as in *specularis*. Lines rather thick, antemedian far from base, the basal areas heavily strigulated with fuscous; distal area characteristic, entirely suffused except a patch between hindmargin and 1st median. Underside similar to upper, with less red irroration. Omei-shan, W. China, 2 ♂♂, 13–15 August in my collection.

42. Genus: **Apericallia** *Leech.*

More slenderly built than *Phalaena*, wings narrower, more smoothly scaled, forewing slightly concave from apex to 3rd radial, here pointed, otherwise smooth. Palpus rather long and strong. Antenna in ♀ simple. Pectus not densely hairy. Femora glabrous. Hindtibia in ♂ slender. Neuration of *Phalaena*. Erected for the single species here given.

A. bilinearia *Leech* (16 c). Very pale violaceous (almost whitish), dusted with olive-brown, hindwing paler. The lines of the forewing are almost straight and parallel, reproduced beneath; that of the hindwing is fine and indistinct beneath, but accompanied proximally by a shadowy band of ochreous. W. China: Putsu-fang and Ta-chien-lu; May–July.

43. Genus: **Heterocallia** *Leech.*

Habitus of the preceding, agreeing in most structural characters. Antenna in ♂ simply ciliated. Hindtibia in ♂ strongly thickened. Forewing with 1st subcostal stalked with 2nd and anastomosing with costal. Also founded on a single species.

H. truncaria *Leech* (16 c). Very distinct in the strongly curved postmedian line, blackest in the middle, where it is followed by a longitudinal dark brown mark behind the 3rd radial; and in the pure white spots which mark the anterior part of the subterminal line. W. China and Formosa.

44. Genus: **Leptomiza** *Warr.*

Perhaps not a very natural or sharply defined genus. HAMPSON differentiates it from *Phalaena* by the more oblique distal margin of the forewing and the simple ♀ antenna. From *Garaeus* it is distinguished by the naked eye. Antenna in the ♂ variable; also the wing-shape, though the distal margins are always crenulate. The genus is chiefly Indian.

- calcearia*. **L. calcearia** Walk. (= *mediolimbata* Pouj.) (16 c). Distinguished by the sharp teeth in distal margin and the olive-green or green-yellowish band from apex of forewing to middle of inner margin of hindwing, followed distally by fine dentate silvery grey line. Antenna in ♂ ciliated. An Indian species, but has been taken at Mou-pin.
- dentilineata*. **L. dentilineata** Moore is smaller, the distal margins less dentate, the colour more uniformly olivaceous, a dentate silvery antemedian line better developed than in *calcearia*, the under surface yellower. Described from Sikkim. Specimen from Chang Yang has been referred here, perhaps correctly, though the distal margins approach those of *calcearia*, of which it may be a small form.
- crenularia*. **L. crenularia** Leech (= *ouvrardi* Ob.) (16 c) is somewhat doubtfully placed. Antenna and neurulation as in *Ocoelophora*. A beautiful and quite unmistakable species on account of the arrangement of the pink markings and the dark olivaceous grey antemedian band. W. China: Ta-chien-lu.
- hepaticata*. **L. hepaticata** Swinh. This species again shows a different neurulation, and was made the type of a new genus, *Pristopera*. The 1st and 2nd subcostal are stalked and are connected with the costal. Antenna of the ♂ shortly pectinate. Nearly related to the following, but dark liver-coloured, the lines only quite weakly expressed. Central China, without more exact locality.
- bilinearia*. **L. bilinearia** Leech (16 d), described as *Selenia* (?), is well shown in our figure except that the whitish proximal edging of the first line has not come out clearly. Forewing beneath brighter yellow, the 2 lines present; hindwing paler, also with 2 lines. Central China: Chang Yang, in June. — **hedemanni** Stgr., which I have not seen, must be very close to *bilinearia*, perhaps less variegated in the distal area; underside with stronger dark dusting than upper. Ussuri district.

45. Genus: **Pseudomiza** Btlr.

Also distinguishable from *Garaeus* by the naked eye. From *Leptomiza* it scarcely differs constantly except in having the distal margins smooth, only with the apex of the forewing produced. Chiefly Indian. The type species, *castanearia* Moore, is not Palearctic.

A. Forewing with 2nd subcostal arising from 1st. Antenna in ♂ simple (*Dissoptaga* Warr.).

- flava*. **Ps. flava** Moore. The name-type is uniformly yellow, the markings as in the aberration. — *ab. sanguiflua* Moore (16 c) is a common form with the entire wings, except a narrow band and distal margin, bright salmon pink. Both forms were described from the Khasi Hills but occur at Mou-pin. WARREN (in litt.) refers here *timandra* Alph., described as from Korea „? *Dierna*“, but I cannot reconcile either the figure or description.

B. Forewing with 2nd subcostal arising from cell. Antenna in ♂ simple.

- obliquaria*. **Ps. obliquaria** Leech (19 k). Described as an *Auzea*. Palpus shortish. Forewing with a fovea; systematic position doubtful. Easily known by the produced apex of the forewing and straightish distal margin of the hindwing, as well as by the coloration and markings; the broad, very acutely angled postmedian line is pale-edged at the costa. Central China: Chang Yang. Also Formosa.

C. Forewing with 2nd subcostal arising from cell. Antenna in ♂ bipectinate (*Mimomiza* Warr.).

- cruentaria*. **Ps. cruentaria** Moore (16 c) perhaps splits up into several local races, but I have seen too little material to decide. The name-type, from Sikkim, is larger and has the red markings stronger than the figured example from Chang Yang, the subapical spot mostly reddish. The form here figured is also known from Dharmasala. — *flavescens*. **Ps. flavescens** Swinh. (= *lyscaria* Ob.) almost entirely lacks the red shading. Khasis, N. W. India, Chinese Tibet, Chang Yang. Chinese and Formosan examples have the distal margin generally more convex than Indian.

46. Genus: **Ocoelophora** Warr.

Probably related to *Leptomiza*, both sexes with a small round fovea near the base of the forewing, conspicuous on both surfaces, 1st subcostal sometimes anastomosing with costal and often with 2nd subcostal, 2nd subcostal arising from stalk of 3rd to 5th. Antenna of ♂ simple. Range: India-Japan. Possibly only one extremely variable species.

- lentiginosaria*. **O. lentiginosaria** Leech (16 c). Rather variable in size but generally small; postmedian line placed very near distal margin, mostly broken into large vein-dots, the narrow distal area with some dark shading. Underside paler except costal region of forewing; proximal half dusted and strigulated with blackish. Japan and W. China. Probably a form of *maculifera* Warr. from the Khasi Hills.

47. Genus: **Xyloscia** Warr.

Face smoothly scaled. Palpus moderate or longish, with moderately appressed scales. Antenna in both sexes bipectinate, in the ♂ with long branches. Femora somewhat hairy. Wings not very robust, smoothly scaled. Forewing with distal margin prominent in middle; 1st and 2nd subcostals free. Hindwing costa elongate, apex cut away, a point at end of 2nd subcostal, distal margin rather sinuous, slightly prominent at 3rd radial. Only two species are known, both Palearctic.

X. subpersata Feld. (16 d). Light wood-colour with browner markings, the postmedian line on the hindwing black. Black discal dots (at least on the hindwing) and sometimes a black spot in the middle of the brown submarginal band of the forewing. The dentate distal edge of the oblique postmedian band is distinctive. Japan.

X. biangularia Leech (16 d) is rather browner, with darker lines, the antemedian of the forewing sharply biangulate, approaching the cell-dot, the distal edge of the postmedian band blacker, not dentate. Central China: Chang Yang.

48. Genus: **Artemidora** Meyr.

Related to *Selenia* and *Phalaena* but more slenderly built, pectus less densely hairy, antenna in ♀ slender, scarcely subserrate. Forewing broader than in *Selenia*, the bend in the distal margin not very pronounced in the ♂, much more so in the ♀; a transparent discocellular mark; 1st subcostal vein anastomosing with costal and with 2nd subcostal (in *Phalaena* generally free), 2nd subcostal often also with 3rd—4th; 1st radial not stalked. Hindwing ample, with a strong angle or tooth at the end of the 1st median. ♀ smaller than ♂. Only the type species is known.

A. maracandaria Ersch. (16 d). Easily known by the shape of the wings and of the darkened median area of the forewing. Hindwing more mixed with ochreous than forewing. Underside heavily dark-irradiated. Zerafshan to the Ili district.

49. Genus: **Artiora** Meyr.

Face with short projecting scales. Palpus short. Tongue short. Antenna in ♂ bipectinate, in ♀ almost simple. Abdomen rather robust. Forewing without fovea; rather narrow, distal margin slightly crenulate, with a deep excision between apex and 1st radial; 1st and 2nd subcostals coincident. Hindwing with costa rather elongate, distal margin crenulate. — Larva stout, somewhat flattened, without protuberances. — This genus also consists of a single species.

A. evonymaria Schiff. (= obscura Aigner) (17 b). Variable in colour. The first figured form, which becomes the nomenclatural type (Hbn. 31), has the forewing and the distal part of the hindwing somewhat infuscated — not a very successful figure but certainly depicting the „coffee-brown“ (violet-brown) form of AIGNER. — ab. **flavescens** ab. nov. (16 d as *evonymaria*) is the commoner, more ochre-yellowish form only in the ♀ somewhat more reddish than in the ♂. — ab. **fuscaria** Wagner (= *exquisita* Aigner) is almost uniform dark brown, darkest distally to the fine pale line which accompanies the postmedian dots. — Egg oval, granulated and pitted, shining brownish grey. Larva slate-grey with longitudinal yellow lines or rows of spots partly filled in with deep orange or red-lead. On *Euonymus* in May. The moth in July—September; only known from Germany and Austro-Hungary.

50. Genus: **Auaxa** Walk.

Palpus short. Antenna in both sexes simple. Femora somewhat hairy. Forewing with apex acute, distal margin gently crenulate, somewhat prominent in middle; 1st—2nd subcostal long-stalked, their stalk anastomosing at a point or connected with the costal, the 2nd later connected with the 3rd—4th; discocellulars angled inwards. Hindwing with distal margin gently crenulate. Only one species known.

A. cesadaria Walk. (= *sulphurea* Btlr.) (16 d. as *sulphurea*). Yellow, the markings reddish. Antemedian line of forewing usually indistinct; postmedian oblique; distal area of forewing broadly reddish; fringe with dark spots. Japan and Korea to W. China.

51. Genus: **Corypha** Walk.

Similar to *Auaxa* and to *Angerona*, but with the palpus long, with long, exposed 3rd joint. Forewing with 1st subcostal free, 2nd free or often anastomosing with 3rd—4th.

C. incongruaria Walk. Ochreous, much less yellow than the preceding species, distal area not appreciably redder. Further distinguished by the fine but well-expressed darker lines, the antemedian strongly angled, the other two only a little sinuous, continued on hindwing. N. China, Yokohama and Kiushiu.

52. Genus: **Zethenia** Motsch.

Face with projecting cone of scales. Palpus moderate, rough-scaled. Antenna in ♂ with fascicles of cilia. Breast and femora densely hairy. Forewing in ♂ with fovea; 1st and 2nd subcostals stalked, the 1st anastomosing or connected with costal, its base sometimes obsolete so that it appears to arise from the costal. Contains only a few E. Asiatic species, all very closely related.

albonotaria. **Z. albonotaria** Brem. (16 e as *albinotaria*) is characterized by the black, generally white-pupilled spot distally to the postmedian line. It is generally larger than the other species, distal margin of forewing more sharply elbowed at the 3rd radial, postmedian line broken into vein-dots, discal dot of hindwing minute or wanting. Variable in ground-colour, strongly or scarcely rufous. Distributed in E. Asia, abundant in Japan.

rufescentaria. **Z. rufescentaria** Motsch. (= *consociaria* Chr.) (16 d, e). Also variable, but always without the submarginal spot. Generally more variegated, the space between the median shade and postmedian line sometimes developed into a dark band; postmedian line better developed, sinuous, the vein-dots standing out on it as minute teeth; hindwing with discal dot sharply expressed. — ab. **grisearia** Leech, commonest in the *grisearia*. ♀, is greyer, the median area commonly darkened. S. E. Siberia and Japan, in the latter country even more abundant than *albonotaria*.

inaccepta. **Z. inaccepta** Prout (16 e) may be known at once by the smoother distal margins and the almost uniformly dark-dusted wings. Antemedian and median lines almost or entirely wanting, postmedian weakly expressed by vein-dots; distally to this the forewing is dark-bordered, leaving free only a small spot at the apex. ♂ in general darker clouded than ♀. China: Shanghai, Ningpo, Chekiang and Chungkung.

contiguaria. **Z. contiguaria** Leech (= *obscura* Warr.) (16 e) is intermediate in shape between the two preceding, but is on an average smaller. Extremely variable, generally darker than the other species, very commonly with white spots on each side of the 2nd median vein, accompanying the postmedian line of dots distally. Not rarely a black spot is developed as in *albonotaria* (16 e), but this is not white-pupilled. Discal dot of hindwing well developed. Distributed in Central and W. China and Formosa.

53. Genus: **Zanclidia** gen. nov.

Face flat. Palpus short. Antenna in ♂ simple. Femora not hairy. Forewing with fovea; 1st and 2nd subcostals long-stalked, free. Perhaps related to *Zethenia* but distinct in several characters and in the coloration and markings. I have adopted a MS. generic name of WARRENS.

testacea. **Z. testacea** Btlr. (16 e). A brightly coloured species easily recognized by its shape, the white discal spot, pale yellow patch costally, etc. The ♀ is larger, rather paler, hindwing without the dark apical patch; ovipositor long. Japan.

54. Genus: **Endropiodes** Warr.

Scarcely differentiable in structure from *Anagoga*, to which it should perhaps sink. But as the distal margins are more irregularly shaped and its retention here enables us to place the species in the same position as STAUDINGERS Catalogue, I prefer not to sink it until it has been more closely studied or the earlier stages made known.

Geographical distribution: Amurland to Japan.

indictinaria. **Z. indictinaria** Brem. (= *versicoloraria* Chr., *snelleni* Hedem.) (16 e). Very pale reddish grey with darker red-brown dusting and cloudings, very variable in extent; a black discal dot on each wing; antemedian line of forewing straight, postmedian strongly angled, followed by black dots on each side of 1st median vein. Common in the Amur and Ussuri district and Japan. — **abjecta** Btlr. (16 e) is a deeper, more uniformly reddish form and lacks the black dots distally to the postmedian. Japan: Gifu.

55. Genus: **Gonodontis** Hbn.

Face densely rough-scaled. Palpus moderate, rough-scaled below. Tongue present. Antenna in ♂ usually bipectinate. Pectus and femora densely hairy. Forewing rather long, distal margin angled in the middle often crenulate throughout; 1st subcostal vein not anastomosing with costal; 2nd arising from cell, commonly free throughout. Hindwing with distal margin often crenulate. Larva twig-like, with additional rudimentary claspers on the 4th and 5th abdominal segments. A very natural genus, inhabiting the Palearctic Region and N. India to Formosa. Possibly the Indian to Japanese and Formosan representatives could form a separate section (*Nipphonissa* Btlr.) with less long hair-scales beneath the palpus and often smoother wing-margins.

G. bidentata Cl. (= *dentaria* Hbn.) (16 f). Antennal pectinations in ♂ short. Distal margins strongly *bidentata*. (that of forewing irregularly) crenulate. Discal marks ocellated. Median area of forewing variable in width. Colour variable, in the name-type grey-brown. — ab. **nigra** Prout (= *surtur* B.-Haas) is a Mendelian melanic *nigra*. form which has recently become common in parts of Lancashire and Yorkshire. — ab. **edentula** Krulik. (= *eden- edentula* Rbl.) lacks the smaller teeth in the distal margin of the forewing. — **exsul** Tchetverikov (= *asiatica* B.-Haas) *exsul*. is smaller, greyer, the forewing narrower, more distinctly marked, less strongly dentate. Sajon, Kentei Mountains, etc.; Amurland. — Larva somewhat thickened posteriorly, extremely variable, best recognized by its shape and additional prolegs; whitish-ochreous, ochreous, purple-brown or grey-brown, mottled and clouded, or mixed with green like lichens, very responsive to its environment. Polyphagous on trees in August and September. Pupa in a cocoon among the roots, hibernating. Moth in May—June. Central and N. Europe, S. Russia, Central Asia, E. Siberia, ? Japan.

G. graecaria B.-Haas, founded on a ♀ from Attica, has the shape of the 2 following, proximal and *graecaria*. distal areas of forewing yellow-brown, dark dusted, median area much darker, twice as wide anteriorly as posteriorly.

G. muscularia Stgr. (16 f). Very similar to some weakly marked forms of *bidentata*, the ♂ antennal *muscularia*. pectinations slightly longer, the smaller teeth in the distal margin less developed, lines of forewing less approximated at hindmargin, the postmedian not (as in *bidentata*) with slight curve basewards at costal extremity, straighter, not dentate. Zerafshan, Ferghana, Issyk-kul, Ili, Korla, Koko-Nor.

G. alienata Stgr. (25 g). ♂ antennal pectinations again somewhat longer. Wings more straw-coloured *alienata*. or yellow-brownish, the lines placed nearly as in *muscularia* but much more conspicuous. Kashgar, Ferghana, Ili district and Koko-Nor.

G. insulata Bastelb. (= *variegata* Wilem.) (25 g). In general rather smaller than *bidentata*, antennal *insulata*. pectinations similar, apex of forewing not acute, distal margins not crenulate, only the forewing with a rather deep, rounded excision between the 1st and 3rd radial. Extremely variable in colour, yellow-brown to purple-brown, forewing generally with a pale apical patch. Best known from Formosa; also from Chungking (W. China).

G. arida Btlr. (16 f). Antennal pectinations about as in *alienata*, distal margin much less deeply *arida*. crenulate. Ground-colour slightly more reddish, postmedian line differently shaped, more broadly pale-edged distally, shading off into the ground-colour proximally. Japan and probably the Ussuri district. — **bilinearia** *bilinearia*. Swinh. is often duller coloured (but very variable), postmedian line slightly more curved, finer, less diffuse proximally, the pale line beyond it much more slender. N. W. Himalayas.

G. aurata sp. nov. (16 f). Apparently hitherto confused with *arida*, although BUTLER many years *aurata*. ago gave it the Mst. name of *aurata*. Forewing not footed at 1st radial. Nearest to *lentiginosaria* Moore, from India, smaller, less deeply coloured, postmedian line nearer distal margin; ♂ antenna bipectinate. From the similarly coloured *alienata* the wingshape and the postmedian line of both wings distinguish it. Japan: Imaichi, etc. in August; 3 ♂♂ in coll. Brit. Mus., 1 in coll. SEITZ.

G. acutaria Leech (16 g). Shape about as in the preceding, the apex and the point at 3rd radial acute. *acutaria*. Brighter golden yellow, discal ocellus minute, postmedian line well developed. Chang Yang. — **contaminata** *contami-* *nata*. *form. nov.* (= *bivittaria* Btlr. nec Moore). Paler, very coarsely and irregularly speckled, both wings with black terminal dots generally developed. Differs from *aurata* in the minute cell-marks. Dharmasala and Jalauri Pass, N. W. Himalayas, coll. Brit. Mus.

G. similaria Moore differs from all the other Palearctic species in the simple ♂ antenna (genus *Cenocete- similaria*. *nucha* Warr.). Colour of *bidentata*, shape nearly as in *muscularia*, the excision between the radials of forewing deep; lines formed nearly as in the *arida* group, postmedian with white dots on the veins as in *bidentata*. Kulu. Also in Sikkim.

56. Genus: **Colotois** Hbn.

Face rough-haired and with a tuft projecting from beneath antenna partly across the eye. Palpus short. Antenna in ♂ very strongly bipectinate. Pectus and femora densely hairy. Forewing with 1st subcostal anastomosing or connected with costal and with 2nd subcostal. ♀ much narrower winged than ♂. Larva twig-like, with rudimentary prolegs on the 5th abdominal segment (which disappear at the last moult) and with a pair of small raised points on the dorsum of the 8th abdominal segment. HÜBNER'S genus *Colotois* was very heterogeneous, but MEYRICK has restricted it to *pennaria*, which is therefore the type.

C. pennaria L. (= *cerasi* F.) (16 h). Very variable, but easy to recognize. The white, dark-margined *pennaria*. subapical dot (sometimes entirely dark) is very rarely wanting. The ♂ is usually of the warm golden brown

bifidaria. colour of autumn leaves, the ♀ either paler with reddish lines or uniform reddish brown. — ab. *bifidaria* Haw.
castinearia. has the lines (bars) confluent at the hindmargin. — ab. *castinearia* Lambill. is described as having the wings „strongly charged with blackish atoms“, thus intermediate towards, or perhaps intended to indicate,
obscura. the following. — ab. *obscura* Aigner is almost uniformly fuscous, the veins remaining nearly of the typical ground-colour. — Egg olive-green with a ring of pale specks round the micropylar end; laid in a cluster on a twig, hibernating. Larva purplish grey with ochreous spots, the anal points reddish. On oak and many other trees. Moth from September to November, the ♂ common at light, the ♀ much more sluggish. Distributed in Central Europe, Asia Minor and Transcaucasia.

arnoldiaria. **C. arnoldiaria** Ob. is placed by its author in this genus, on account of the strongly pectinate ♂ antenna, but no other information is given as to its structure. Abdomen more slender, costal margins rounder, distal margins smoother, colour bright yellow, with the lines red-brown, irregular, thickened at costal margin, widely separated, the area distally to the postmedian (except in anterior part of forewing) mostly red-brown, on the forewing containing 2 white spots between the 3rd radial and 2nd median, recalling those of *Eumera regina* (15 k); cell-spots large, dark redbrown. Sidemi, Manchuria.

57. Genus: **Dasycorsa** nom. nov.

Closely allied to *Colotois* but without the tuft of hair overhanging the eye. Face and palpus perhaps with still longer projecting hair. Wings in ♂ slightly narrower. Only one species known. STAUDINGERS name of *Dasycephala* is preoccupied.

modesta. **D. modesta** Stgr. (16 f). Forewing brown or reddish, with very coarse blackish irroration and strigulation, a large black discal dot and slight oblique shade from apex. Hindwing and underside paler, discal dots present. Dalmatia, Asia Minor and Syria.

58. Genus: **Pachyligia** Btlr.

Characters of *Dasycorsa* but the face more protuberant, tegula strong, ending in a broad raised tuft, hindwing with a small projecting lobe at anal angle, here with very long dark fringe. Only one species known.

dolosa. **P. dolosa** Btlr. (16 f). Forewing dull grey-brown with small black cell-mark and tortuous, in places almost interrupted, black lines, finely and interruptedly white-edged on their reverse sides; a weak, equally tortuous median shade and traces of subterminal. Hindwing much paler, with large discal spot. Japan.

59. Genus: **Crocallis** Tr.

Characters of *Gonodontis* but the tongue obsolete, forewing with distal margin less angulated in the middle, 2nd subcostal generally anastomosing or connected with 3rd—4th. Larva without additional prolegs. A small Palearctic genus.

tusciaria. **C. tusciaria** Bkh. (= *extimaria* Hbn.) (16 g). Distinguished by the black or almost black lines^v which border the median band and by the sinuous course of the antemedian. — ab. *virgata* Rbl. Median area of forewing filled in with blackish brown. — *gaigeri* Stgr. (16 g) is a darkened, greyish form which occurs as an aberration in W. Germany, a local race in Dalmatia, the Southern Tyrol and Central Italy. — Egg almost brick-shaped, with slight longitudinal ridges; purplish white, marked with darker purple. Larva variable, brown, often with dark dorsal lozenges. On sloe, that of *gaigeri* on Rosmarinus, Cistus, etc.^v Imago in July, local, Central and S. Europe to Transcaucasia.

elinguaria. **C. elinguaria** L. (16 g). Differs from *tusciaria* in the paler ground-colour, larger discal spot and straighter antemedian line. In the name-type the median area is more reddish. — ab. *fasciata* Gllm. has the median band uniformly fuscous. — ab. *fusca* Reutti (= *insolitaria* Fuchs, *solitaria* F. Fuchs) is fuscous, only the fine lines remaining yellowish. — ab. *unicolor* ab. nov. has the entire forewing of a uniform reddish with no markings. — *trapezaria* Bsd. (= *prosapiaria* Robs. & Gardn.) is a pale, weakly marked form, the lines in general further apart. — In extreme cases (ab. *aequaria* Fuchs) the median area is quite concolorous with the proximal. A local race in Castile, dominant in Dalmatia and Asia Minor but known from many localities. — Egg brick-shaped, laid one upon another in rows; white, marbled with olive brown. Hibernates. Larva thickest posteriorly, light yellowish brown or darker brown, with irregular dark markings, the dark dorsal line widening at the incisions. On various trees and shrubs, full-fed in June. Imago in July—August, in southern localities with a partial 2nd brood in September; flies late at night. Throughout most of Europe, Armenia, Altai, E. Siberia.

auberti. **C. auberti** Ob. (16 g) differs from *elinguaria* in having the groundcolour grey or light-brown, not yellowish, median band of more equal breadth throughout, the lines which limit it yellowish, differently shaped.

Line of hindwing noticeably sinuous. Algeria. — *fuliginosa* *Rthschd.* is on an average somewhat smaller and *fuliginosa*. less robust, the colour less brownish, the yellow lines edged on their obverse sides with blackish, this colour sometimes overspreading most of the median area, line of hindwing more strongly sinuous. Perhaps a separate species. Central Algeria.

C. dardoinaria *Donz.* (= *aglossaria* *Bsd.*) (16 g). Forewing rather broader than in *elinguaria*, markings *dardoinaria*. similar, colour quite different. Yellowish grey, the forewing darker, tinged with olivaceous, dusted with fuscous, discal spot large, its centre pale, lines pale yellowish. S. France and Catalonia.

C. boisduvaliaria *H. Luc.* (16 g). Perhaps not a *Crocallis*. MEYRICK says the face is prominent, with *boisdu-* appressed scales. Darker than the other species, forewing fuscous mixed with black, distal area and hind- *valiaria*. wing (except near the postmedian line) ashy grey. Median area of forewing broad, the blackest shades longitudinally placed, the veins paler; cellmarks pale-centred; postmedian line sinuous. Algeria.

C. jordanaria *Stgr.* (17 b). Distal margins smoother than in typical *Crocallis*; habitus recalling the *jordanaria*. robust, tongueless members of *Dyscia*, which should probably be transferred here. Dull sand-colour, the lines of the forewing very weakly indicated, postmedian darker-dotted on the veins, discal mark of forewing not very strong, rather large, elongate. Hindwing almost markingless. Palestine.

60. Genus: **Dalima** *Moore.*

Face shortly rough-scaled. Palpus rather short, with long projecting scales below, 3rd joint short. Antenna in ♂ dentate, with fascicles of cilia (pectinate in some Indian species). Pectus and femora hairy. Forewing pointed at the extremity of the 2nd subcostal, arched or occasionally truncate anteriorly to this point; fovea present; 1st subcostal free, 2nd stalked with the 3rd—5th. Hindwing usually with truncate apex and a point at extremity of 2nd subcostal. A. N. Indian genus, but extending to W. and Central China. Rather large moths, generally recognizable by their shape and the warm brown or yellowish colouring, resembling dead leaves.

D. variaria *Leech* (16 h). A variable species but distinguishable by its shape, the truncation at the *variaria*. apex of the hindwing slight but appreciable. Underside orange, irrorated with purplish fuscous. The coloration of the upperside in the name-type is shown in our figure. — ab. *albomaculata* *Leech* is intermediate in colour *albomaculata*. but differs in having a large patch of the whitish-violet scales occupying the angle of the postmedian line of the forewing. — W. China.

D. obliquaria *Leech*, founded on a single worn ♀ from Wa-ssu-kow (W. China), is closely similar to *obliquaria*. the following but smaller, lighter, more reddish brown, the cell-spots obsolete, the angle of the postmedian line more acute, reaching more nearly to the distal margin.

D. acutaria *Leech* (16 h). Easily distinguished from dark specimens of *variaria* by the non-crenulate *acutaria*. postmedian line, absence of dark spot at its posterior end, more strongly lined hindwing, dark shading in distal area both above and beneath, etc. On an average larger, hindwing with sharper point at end of 2nd subcostal. W. China: Pu-tsu-fang and Omei-shan.

D. ochrearia *Leech* (16 h). Much lighter, fleshy ochreous, sometimes with a slight violaceous admix- *ochrearia*. ture. Costal and hindmarginal spots of forewing strong, the yellow line rather broad. Hindwing with still stronger angle. Chang Yang and W. China.

D. columbinaria *Leech* (16 h). Apex of hindwing not truncate. Ground-colour pinkish lilacine, the *columbina-* postmedian line darker than in *acutaria*, both the lines of the hindwing strong, the median obliterating the *ria*. discal spot. W. China: Mou-pin and Omei-shan.

D. subferrugineata *Pouj.*, founded on a single ♀ from Mou-pin, is unknown to me but evidently close *subferrugi-* to *columbinaria*. Much paler, rosecolour, the lines ferruginous, the median on the forewing reaching the *neata*. hindmargin, where it closely approaches the postmedian. Apex of forewing much more falcate, otherwise I should suppose that *columbinaria* might be a dark form of it.

61. Genus: **Angerona** *Dup.*

Face with appressed scales. Palpus short or rather short, roughscaled. Tongue present. Antenna in ♂ bipectinate. Femora not or scarcely hairy. Hindtibia in ♂ dilated. Forewing without fovea; all veins present, 1st subcostal arising from stalk of 2nd (only in *grandinaria* from cell) always anastomosing or connected with costal. Hindwing with distal margin more or less crenulate, sometimes only very slightly. — Larva twig-like, thickened posteriorly, a transverse dorsal ridge on the 1st abdominal segment, double-pointed humps on the 5th abdominal and smaller protuberances on the 6th and 8th. — Distributed in the Palearctic Region, also recorded from India and North America.

prunaria. **A. prunaria** L. (= *fulvularia* *Hufn.*, ♀ *corticalis* *Scop.*) (16 i). ♂ bright orange, coarsely marked with *fuscaria*. small fuscous strigulae. ♀ pale yellowish, with more minute strigulae or dots. — ab. **fuscaria** *Prout* (= *franca-corylaria*. *Lambill.*) is fuscous throughout. — ab. **corylaria** *Thnbg.* (= *sordiatia* *Fuessl.* nec L.) (16 i) has the proximal and distal areas infuscated, a median band of the ground-colour, not quite reaching the hind margin, on *pickettaria*. the hindwing not sharply defined proximally. — In ab. **pickettaria** *Prout* the ground-colour also shows itself in the distal area of the forewing, excepting a pyramidal band from the hindmargin about to the 1st radial *spangbergi*. vein, and also at the apex of the hindwing. — ab. **spangbergi** *Lampa* (= *subalpinaria* *Lambill.*, ? *unicoloraria* *Horm.*) (16 i, as *prunaria*) is without fuscous irroration or strigulation. *HOERNUZAKIS* form, however (from *pallidaria*. *Bucovina*) is said to show a few grey dots and sometimes a darkened distal margin. — ab. **pallidaria** *Prout* (♀ = *aureocincta* *Ob.*) also lacks the irroration but shows very shadowy grey (in the ♀ more yellow-brown) *nigrolimbata*. shading arranged as in ab. *corylaria*. — ab. **nigrolimbata** *Joannis* has a narrow fuscous border, rather broader in the ♂ than in the ♀; the rest as in the name-type or *spangbergi*. — **kentearia** *Stgr.* (= *sibirica* *Fuchs*) is *kentearia*. smaller and paler, the ♀ whitish with strong irroration. *Kentei* Mountains to N. E. Siberia. — ab. **constirpataria**. **taria** *Fuchs* is a ♂ form of *kentearia* with ♀ coloration. — Egg small, somewhat flattened oval, with minute hexagonal depressions; red. Larva yellowish brown or dark brown with irregular lighter mottlings, lines interrupted or wanting. On blackthorn, whitethorn and other shrubs, etc., hibernating. Moth in June—July, widely distributed in Europe and through Siberia to Japan.

nigrisparsa. **A. nigrisparsa** *Btlr.* (16 i). Quite unmistakable on account of its bright yellow ground-colour and sprinkling of black dots. Distributed in Japan.

prattiaria. **A. prattiaria** *Leech.* Very variable in size and colour, characterized by the 3 conspicuous, anteriorly bent lines of the forewing and the large whitish spot in middle of distal area, partly surrounded with dark *unicoloraria*. clouding. The crenulations in the distal margin of the hindwing also vary in depth. — ab. **unicoloraria** *Leech* is rather small, very weakly marked, the lines little curved anteriorly, distal margin of hindwing very feebly crenulate. *Oiwake*. — *LEECHS* types of *prattiaria* were also from *Oiwake*. Large, brightly coloured examples occur at *Chang Yang*, an equally large, but paler form at *Omei-shan* and a dull reddish form at *Mou-pin*.

grandinaria. **A. grandinaria** *Motsch.* (= *serrata* *Brem.*, *orientalis* *Hedem.*) (17 b) bears some slight resemblance to large forms of *prattiaria* but is very distinct; the middle line of the forewing is replaced by a brown shade and the characteristic pale spot of the distal area is altogether wanting. Variable, the ♂ generally browner, the ♀ yellower. S. E. Siberia. Korea and Japan.

aexaria. **A. aexaria** *Walk.* (16 i). A conspicuous yellow species, forewing with reddish distal border. the lines represented by rows of dots arising from large costal spots. Japan and Korea to W. China.

62. Genus: **Ourapteryx** *Leach.*

Face with short projecting hairs or slight tuft. Palpus short or moderate. Antenna in both sexes simpl. Breast densely hairy. Femora hairy. Forewing with apex rather acute, distal margin straight; 1st and 2nd subcostals coincident (or occasionally long-stalked), anastomosing or connected with costal; no fovea. Hindwing with apex rather prominent but rounded, a more or less long tail at the end of the 3rd radial. Large moths, recognizable at a glance by their shape and pattern. Egg „upright“, the micropylar axis being quite perpendicular to the surface on which it is deposited; distinctly ribbed from the base to the micropylar area, recalling a butterfly egg. Larva very slender, stick-like, tapering anteriorly, a rounded protuberance on the side of the 3rd abdominal segment, a more pointed one on the back of the 5th, anal flap bifid. Pupa suspended in a light silken hammock mixed with leaf, the duration of this stage quite short. The moths fly wildly at dusk or later at night and come readily to light. All are of large or moderately large size and their special aspect, as well as some features in the early stages, suggest that they should form the type of a separate subfamily. Their range extends from Europe to Japan, Formosa, the Greater Sunda Islands and W. India.

sambucaria. **O. sambucaria** L. (17 c), the type of the genus, is the only European species. Pale yellow, the lines generally fine, concise, olivaceous, no grey shading between the spots at the tail of the hindwing. Apex of *deflexaria*. forewing minutely falcate, at least in the ♀. Face ochreous brown. — ab. **deflexaria** *Schultz* has the lines of *olivacea*. the forewing approximated, at the hindmargin confluent. — ab. **olivacea** *Stdfs.* (17 c), chiefly a product of artificial warmth, is a small second-brood form with strong olivaceous suffusion, narrow yellow bands remaining contiguous to the usual lines. — ab. **cuspidaria** *Bird.* Distal margin of forewing prominently elbowed at the 3rd radial. — Egg orange, with about 16 longitudinal keels and between them transverse lineations. Larva grey-brown, the colouring arranged in a succession of scarcely noticeable longitudinal lines. On elder, ivy and

other plants, hibernating. Moth in July, a few small second-brood specimens in September. Central and S. Europe to Altai. — *persica* Mén. (= *nivea* Btlr.) (17 c) differs in being white or almost white, the lines often *persica*. thicken, fringe of forewing more reddish, apex less falcate. Very variable in size. Distributed from Transcaucasia to Japan. THIERRY-MIEG and BASTELBERGER unite it with *ebuleata*. — *citrinata* form. nov. Shape *citrinata*. of *persica*, lines and cell-mark at least as thick, ground-colour as bright yellow as in *sambucaria*, slightly more greenish tinged, with stronger greyish strigulation, the lines more greyish. W. China: Pu-tsu-fang, June—July, 4 ♂♂ in coll. Brit. Mus. Perhaps a distinct species. The ochreous brown face distinguishes it from *ebuleata*.

O. similaria Leech. (17 c). Similar to the whitest *persica*, forewing rather shorter, the distal margin *similaria*. being less oblique, hindwing with tail shorter, the secondary tail at the 1st radial relatively better developed. Face and palpus bright golden brown, face paler below. Omei-shan and Chang Yang. Also on Formosa.

O. cretea Swinh. (= ? *lata* Matsumura) (17 f, as *cretacea*). Smaller than *similaria*, hindwing rather *cretea*. narrower, tail still shorter, wings less strigulated, line on hindwing rather more curved. Lower part of face sometimes white. Japan. Possibly a *Euctenurapteryx*; I have before me ♀♀ only.

O. ebuleata Guen. (= *multistrigaria* Walk., *kantalaria* Feld.) (17 d). Very like *persica* but generally *ebuleata*. intermediate towards the colour of *sambucaria*. Differs from both in having the face white or whitish, except a narrow band on upper part. Apex of forewing not falcate. Strigulation on forewing and distal part of hindwing strong, nearly always some slight grey shading between the spots at the tail. Lines and cell-mark generally thick. My material agrees with GUENÉES description; OBERTHÜRS figure is brownish, scarcely recognizable. N. India and W. China. — *yerburii* Btlr., founded on a single discoloured ♀ from Murree, is perhaps *yerburii*. an aberration, differing chiefly in shape; apex of forewing sharper, distal margin faintly subconcave; tail of hindwing longer, lines rather slender. Face apparently not whitish. ALPHERAKY records an example from Szechuan. — *purissima* Th.-Mieg (= *thibetaria* Bastelb.) is white, scarcely tinged with yellow, fringe of *purissima*. forewing white. Face white, otherwise it might be confused with *persica*. Alexander Mountains, Central Asia; „frontier of Tibet“ at 3000 m elevatoin (?). — *caschmirensis* Bastelb. is also white, but larger, costal margin *caschmirensis*. broadly white, scarcely strigulated, lines more leaden grey. Face pure white with narrow red-brown band above. Kashmir.

O. pluristrigata Warr. (17 c) also has the ground-colour pure white, face and palpus also white, the *pluristrigata*. forewing rather evenly striated with pale fuscous, fringe not rufous, the hindwing with the spots small, the fringe faintly tinged with rufous. N. W. Himalayas.

O. costistrigaria Leech (17 e). Differs from all the foregoing in the black costal marks, the strong, *costistrigaria*. almost continuous strigulation of the distal area, etc. W. China: Omei-shan.

O. latimarginaria Leech (17 e) is possibly a remarkable aberration of the preceding, but the lines are *latimarginaria*. narrower, that of the hindwing rather differently placed, the costal strigulation slighter, distal area of forewing almost entirely black-grey, the 2 normal spots of the hindwing large and red, a third spot posteriorly to them black. Omei-shan.

O. excellens Btlr. (17 e) is very distinct in the more oblique antemedian line, the dark streak along *excellens*. the 2nd submedian of both wings, row of black terminal spots of hindwing etc. Dharmasala.

O. kernaria Ob. (17 d). Whitish, the usual lines thick and in addition with both wings irregularly *kernaria*. spotted with grey-brown. Hindwing with 3 black spots at distal margin. W. China: Tse-kou.

O. adonidaria Ob. (25 b). More yellowish, still more strongly spotted, postmedian line differently *adonidaria*. placed, hindwing with shorter tail and only two marginal spots. W. China: Tien-Tsuen.

O. aristidaria Ob. (25 c) is according to the figure certainly no *Ourapteryx*, but as no structural clue *aristidaria*. is given it must be provisionally left here. Shape and general aspect of the African genus *Eurythecodes* or the American *Antepione*. Yellow, with slight purple-brown irroration; a postmedian line at about two-thirds (on hindwing scarcely beyond one-half), distally to which both wings are entirely purple-brown. Discal dots minute. Antenna in ♂ perhaps bipectinate. Possibly related to *Auaxa*. W. China: Siao-lou.

63. Genus: **Sirinopteryx** Btlr.

Characters of *Ourapteryx*, but with the first two subcostal veins of the forewing arising separate, the 1st successively anastomosing with the costal and with the 2nd subcostal. Only 3 or 4 species are known, chiefly N. Indian.

S. rosinaria Ob. Bright yellow, the costal edge of forewing (more broadly at the base) and all *rosinaria*. fringes red; cell-spots black, above mixed with red, lines weak, greyish, the antemedian sinuous from cell-spot to hindmargin. Distal margin of hindwing crenulate, the tail rather slight. Siao-lou, W. China.

64. Genus: **Euctenurapteryx** Warr.

Characters of *Ourapteryx* but with the ♂ antenna bipectinate, the wings more strongly built, more thickly scaled, the 1st and 2nd subcostals of the forewing long-stalked, never coincident, the tail at the 3rd radial of the hindwing quite short, sometimes not longer than that at the 1st radial. The early stages were described in 1910 by NAGANO, but in Japanese. Only a few species are known. *Energopteryx* Th.-Mieg is a synonym.

maculicaudaria. fumosa. **E. maculicaudaria** Motsch. (= *luteiceps* Feld.) (17 d) is distinguished by the not very prominent tail at the 1st radial and by the brown or brown-grey lines and fringes. — ab. **fumosa** ab. nov. is uniform smokecolour instead of white, the lines traceable in yellow-brown, spots on hindwing normal. — Japan and Chekiang.

nigrociliaria. **E. nigrociliaria** Leech (17 e). Very much larger, the markings thicker, blackish, hindwing with a cell-mark; fringes black. Tail at 1st radial of hindwing much more pronounced, the margin being somewhat cut away anteriorly to it. W. China.

parallelaria. **E. parallelaria** Leech. (17 a) Shape and coloration of *nigrociliaria*, scarcely larger than *maculicaudaria*, cell of forewing longer, postmedian line placed much nearer to the cell-mark than in the other two species parallel with antemedian, the line of the hindwing slender, sinuous, passing proximally to the cell-spot, which is quite small. Chang Yang.

jesoensis. **E. jesoensis** Matsumura is unknown to me, possibly only a form of *maculicaudaria*, but smaller, the tail of the hindwing short, simple (i. e. the anterior projection wanting), the ground-colour perhaps less clear white, the postmedian line of the forewing and the single line of the hindwing almost parallel with the distal margin. Japan: Yesso? (the entire description is in Japanese).

horishana. **E. (?) horishana** Matsumura is also unknown to me. The figure (unfortunately ♀) resembles *maculicaudaria* but is rather smaller, the lines thicker, the antemedian rather sinuous, becoming oblique posteriorly, that of the hindwing straight, nearer the base, directed towards the distal margin (not towards anal angle), becoming obsolete near it at the fold. Japan (?).

65. Genus: **Tristrophis** Btlr.

Neuration of *Euctenurapteryx*, antennal structure and general habitus of *Ourapteryx*, rather narrower winged, tail of hindwing slight. Face smooth. A genus of only a few E. Asiatic species, probably belonging with *Myrteta* rather than with *Ourapteryx*, with which it has hitherto been associated.

veneris. **T. veneris** Btlr. (17 f, g). Recognizable by the extremely oblique first band, the presence of a submarginal band (constricted at the veins) on the forewing, and the bright ochreous submarginal band of the hindwing. — In ab. **venerata** Th.-Mieg the cell-mark posteriorly touches the 2nd band. — ab. **unistriga** Warr. lacks the first two bands of the forewing, though a dot at the costa and one on the median vein indicate the antemedian. Japan: Yokohama, Nikko etc., common.

subpunctaria. **T. subpunctaria** Leech (= *obtusicauda* Warr., *subcurvaria* Ob.) (17 f) combines the structure of *Tristrophis* with the superficial appearance of *Ourapteryx*, though the lines of the hindwing distinguish it from the latter. Japan. — **oberthueri** nom. nov. (= *subpunctaria* Ob. nec Leech) is larger, apparently broader, the hindwing with a distinct discal mark, less strongly bent postmedian line, no subterminal, the anterior spot more mixed with red. Mou-pin. Unknown to me, probably a distinct species, possibly a form of the following.

siaolouaria. **T. (?) siaolouaria** Ob. differs from *oberthueri* in the obsolescence of the lines, only a slight, broken antemedian line on the forewing remaining; cell-marks also reduced. Siao-lou, W. China.

66. Genus: **Thinopteryx** Btlr.

Face prominent, shortly rough-scaled. Palpus moderate. Antenna in ♂ with fascicles of cilia. Neuration of the two preceding genera. Hindwing with a slight tail at the 2nd subcostal, a longer one at the 3rd radial. Indo-Malayan Region to Japan. All the species (or forms) are very closely related.

crocoptera. **T. crocoptera** Koll. (17 f). Bright yellow, with red-orange striation, which is partly confluent into patches. Forewing with subterminal line fine, marked with dark dots on the folds. — ab. **maculosa** nom. nov. (= var. B. Guen.) has dark blotches in the middle of both wings (largest on the hindwing) distally to the cell. — ab. **nebulosa** Btlr. has both wings above and beneath, excepting the marginal area, almost entirely suffused with violet-grey. — **striolata** Btlr., from Japan, is densely irrorated with dark striae. Intermediates also occur. — *crocoptera* is distributed in Japan, Korea, China and N. India.

T. citrina Warr. (= *praetoraria* Hmps. nec Feld.). Coloration of *delectans* Btlr. (17 e) or with *citrina*. more yellow, markings almost as in *crocoptera*, postmedian line rather more sinuous, subterminal marked with shallow dark lunules between the veins. N. India and Omei-shan.

T. delectans Btlr. (17 e). On an average somewhat smaller than *crocoptera*, much less mixed with *delectans* orange, the pale costal area of forewing broad, violet-grey (not white), weakly irrorated, both wings much clouded (but very variably) with slightly darker violet grey, an oblique yellow postmedian band or patch between the 3rd radial and 2nd submedian of the forewing and an antemedian patch on the hindwing. Japan to W. China. — ab. **marginata** Warr. is somewhat smaller and has the yellow margins free from dark irroration. W. China.

67. Genus: **Hypochrosis** Guen.

Scarcely separable in structure from *Osicerda*, distal margin of forewing not bent in the middle; typically the 1st subcostal is connected by a bar with costal while in *Osicerda* it oftener anastomoses, but both genera vary in this respect. Hindwing concolorous with forewing, underside less unicolorous than in *Osicerda*. An Indo-Australian genus; the species here described, with longer palpus, is perhaps not strictly congeneric.

H. mixticolor spec. nov. (17 g). Face fuscous. Palpus of moderate length, porrect, reddish, darker above. Vertex of head pale. Forewing with 1st subcostal anastomosing with costal. Coloration of upper-side nearly as in *pulchraria* Roths., rather more mixed with reddish, the green less decided, much more restricted, ill-defined proximally, followed distally by some paler olivaceous shading; a minute dark cell-dot placed beyond middle of wing, the cell being rather elongate; a sinuous dark postmedian line bounding the green shade. Hindwing with rather larger celldot and vague grey lines and shades. Underside very variegated; forewing basally orange spotted and clouded with purple grey, the rest of the wing predominantly purplish, with some remnants of the orange ground, especially subterminally between the 3rd radial and 2nd median; hindwing more largely orange yellow, the purple mottlings and cloudings strongest anteriorly and apically; both wings with cell-dot and traces of postmedian line, on the hindwing forming black spots at costa and near inner margin. Omei-shan, August, type (♂) in my collection.

68. Genus: **Osicerda** Walk.

Characters of *Plagodis*, but with the face rather smoother and less prominent, the antenna in both sexes bipectinate, forewing and generally hindwing with the 1st discocellular much longer, 2nd discocellular of hindwing commonly more oblique. An indo-Australian genus, which scarcely reaches the Palearctic Region. Colouring generally still brighter than in *Plagodis*, under surface as a rule uniform bright orange. GUENÉE and HAMPSON wrongly call this genus *Prionia* Hbn.

O. rosearia Leech (17 g) is distinguished by the strong rosy suffusion of the upper surface and the fairly regular yellowish lines. Distributed in E. China and Formosa.

O. paupera Btlr. is the dullest coloured species, pale drab above, slightly more ochreous beneath; *paupera*. the black costal spots present on the upper side only. Japan.

O. berytana Rbl. is reddish violet-grey, with transverse rows of dark scales, the costal spots of *berytana*. the forewing quadrate, olive-brown, more distinct rows of blackish scales running from them; fringes olive-brown. Beyrout, one example, April. Unknown to me.

69. Genus: **Plagodis** Hbn.

Face and palpus shortly rough-scaled, the latter rather short or moderate. Antenna in ♂ generally bipectinate, in ♀ simple. Femora scarcely hairy. Forewing elongate, elbowed or toothed at end of 3rd radial; 1st subcostal sometimes arising from 2nd, always anastomosing or connected with costal. Hindwing not broad, distal margin usually sinuous. Larva with head rather small, notched; thoracic segments and 5th abdominal swollen dorsally. A small genus, but found in the Palearctic Region, N. India and North America. All the species are, more or less, similarly coloured.

P. dolabraria L. (= *ustulataria* Hufn.) (17 g). Forewing with innumerable fine, slightly oblique, transverse striae, no distinct lines; the postmedian on both wings indicated by a thick dark fuscous shade posteriorly, distally to which (especially on hindwing) there is defined an ill purplish blotch reaching to the hinder angle. — ab. **atrox** Zerny is a melanotic form, forewing mostly dark chestnut brown, towards the base and hinder angle black. — Larva twig-like, brownish, somewhat variegated, thorax darker dorsally, hump on 5th abdominal and a transverse mark near the tail also dark. On oak, birch and willow, the pupa hibernating. Moth in May—June, Central and E. Europe, Transcaucasia, S. E. Siberia and Japan.

subpurpuraria. **P. subpurpuraria** *Leech* (17 f). Larger and broader-winged than the other species, palpus longer, ♂ antenna merely serrate, with fascicles of cilia. Wings more glossy, without definite striae, hinder angle scarcely purplish; postmedian line only indicated on hindwing. The underside is more strongly mixed with fuscous and shows decided purple reflections; both wings with large dark discal spot. W. China: Pu-tsu-fang, only the type known.

70. Genus: **Seleniopsis** *Warr.*

Recalls *Plagodis* in shape, but differs in many characters. Face with cone of projecting scales. Palpus long. Antenna in ♂ simple. Forewing with 1st and 2nd subcostals very long-stalked. Hindwing with distal margin crenulate. Only 2 species known.

evanescens. **S. evanescens** *Btlr.* (17 g). Much less warm brown than the *Plagodis* species, very feebly marked, but with 2 large whitish costal spots. Discal dot of forewing generally small, dark brown, of hindwing obsolete. Japan, August—September.

grisearia. **S. grisearia** *Leech* is paler, more greyish, with rather stronger irroration, the proximal costal spot wanting, the cell-mark of forewing longer and blacker, a small cell-mark indicated on hindwing. W. China: Mou-pin, 1 ♂. Perhaps a local form of *evanescens*.

71. Genus: **Scionomia** *Warr.*

Differs from *Anonymia* as follows: palpus shortish or moderate, abdomen in ♂ still longer, wings more densely scaled, forewing with 1st and 2nd subcostals shortly stalked or closely approximated at their origin, the 1st running into the costal, the 2nd well separated from the 3rd, the 4th and 5th coincident. The wings are rather narrower and the pattern, though somewhat Larentiid, does not recall *Ortholitha*. Range: China, Japan, Formosa.

praeditaria. **S. praeditaria** *Leech* (17 g). Rather more glossy than the other species, with a sharper contrast between the broadly darkened median area and the lighter, browner distal area; the whitish line which separates these areas is slender, equally well expressed throughout. W. China: Pu-tsu-fang and Mou-pin.

anomala. **S. anomala** *Btlr.* (17 g) has the postmedian line more yellowish, broad anteriorly, obsolescent posteriorly, the distal margin rather narrowly concolorous with this line, otherwise remaining fuscous. Japan: *nasuta*. Tokyo. — **S. nasuta** *subsp. nov.* has the postmedian line of equal thickness throughout (thicker than in *praeditaria*) and making a still stronger, rounded distal projection in the middle. Pu-tsu-fang.

mendica. **S. mendica** *Btlr.* has the postmedian line more dentate, not very sharply expressed, not thickened anteriorly; distal area entirely fuscous. Japan and Chang Yang.

sinuosa. **S. sinuosa** *Wileman* (17 h) is intermediate between the two preceding, the almost uniformly fuscous colouring recalling *mendica*, the distinct, strongly sinuous but not dentate postmedian line more like that of *anomala nasuta*, though less extremely projecting. Japan: Tokyo. Also on Formosa.

72. Genus: **Anonymia** *Warr.*

Face with projecting cone of scales. Palpus rather long, rough-scaled. Antenna in both sexes simple. Femora glabrous. Wings smooth-scaled, with pattern as in the Larentiid genus *Ortholitha*. Forewing with the 1st and 2nd subcostals anastomosing, the 2nd afterwards anastomosing or connected with the 3rd and 4th (very rarely remaining free). Hindwing with the costal closely approximated to the cell for a considerable distance. Range: N. India to W. China. In *grisea* and the Indian *rostrifera*, in which the 2nd subcostal arises from the cell, an areole is formed almost as in the *Larentiinae*; in the other species it is stalked with the 3rd—5th subcostal.

grisea. **A. grisea** *Btlr.* (= *diversilinea* *Warr.*) (17 h). Somewhat variable in colour, now more brownish, now more violet-grey, but easily recognizable by the extremely acute angle in the postmedian line followed by a strong, regular curve. N. India and W. China. In Chinese examples, the median area is handsomely darkened proximally and distally.

latifasciaria. **A. latifasciaria** *Leech* (17 h). Rather larger and darker, median area broad and dark, the postmedian projection rather less acute, postmedian line of hindwing generally distinct, more nearly parallel with distal margin. W. China. Very near *lativitta* *Moore*, but with straighter antemedian line.

73. Genus: **Corymica** *Walk.*

Palpus rather long, with 3rd joint distinct. Antenna in ♂ ciliated. Forewing with apex and sometimes hinder angle acute or slightly produced; ♂ with a very large hyaline fovea; 1st and 2nd subcostals coin-

eident, anastomosing with costal and connected with 3rd—4th. Hindwing with costal margin swollen in proximal half, costal vein widely separated from subcostal (especially in *deducata*), connected by a bar about middle of cell. A very small genus, chiefly Indian.

C. arnearia Walk. (= *vesicularia* Walk.) (17 i). Fovea very elongate, scaleless on both surfaces. Hindwing in ♂ with a tuft of long hair on inner margin. The yellow ground-colour is a good deal irrorated with reddish, particularly at base of costa and apical part of distal area of forewing. Distributed from N. India to Borneo, W. China, Korea and Nagasaki. *arnearia*.

C. specularia Moore is on an average larger, lacks the hair-tuft on the inner margin of the hindwing, the ground-colour is rather lighter yellow, less irrorated with reddish, the apical patch on the upper surface large but indistinct, on the under surface strong. Distributed in India. — **pryeri** Btlr. (17 i) is the Japanese form, with 2 large spots on the hindmargin of the forewing, more or less confluent on the margin itself. — **vitrigera** Btlr. from Dharmasala has the posterior spots still larger, confluent also on the fold, thus enclosing an oval yellow spot. *specularia*. *pryeri*. *vitrigera*.

C. deducata Walk. (= *caustolomaria* Moore, *gensanaria* Leech) (17 i). Less bright yellow (more irrorated with red-brown) and easily known by the central band which traverses both wings. Fovea less extremely developed, on the upperside concealed by scaling. N. India to Korea, Japan and Formosa. *deducata*.

74. Genus: **Opisthograptis** Hbn.

Antenna in ♂ simple. Thorax somewhat hairy beneath. Femora glabrous or very slightly hairy. Forewing with fovea; 1st and 2nd subcostals stalked or often coincident; discocellulars bent, 1st median from (or from close to) posterior angle of cell. Hindwing with distal margin almost even, or with very slight prominence at 3rd radial; costal rather shortly approximated to subcostal near base; discocellulars strongly bent, very oblique posteriorly. Larva rather thick, twig-like, with humped 3rd abdominal and with additional, though shortened, prolegs on the 4th and 5th. Pupa rather slender, in a tough cocoon. Range: Palearctic and northern Indo-Australian Regions.

A. Face with appressed scales; palpus rather short.

O. luteolata L. (= *crataegata* L.) (17 h). The only European species. The name-typical form has on the forewing red-brown costal markings at the base, at the discal mark and triangularly at the apex; faint, irregularly grey antemedian and postmedian lines, interrupted at the veins. Hindwing with dark discal dot and faint grey postmedian line. — **aestiva** Vorb. & Müll.-Rutz is a smaller, more deeply coloured summer-brood form. It seems to be the principal or only form in Tunis. — ab. **flavissima** Krulik. (= *immaculata* Ob.) is almost entirely yellow, only with slight remnants of the costal markings. — ab. **albescens** Ckll. (= *lacticolor* Harrison, *albicans* Rbl.) has the ground-colour pure white instead of yellow. Very pale yellow examples have been separated as **intermedia** Harrison. — ab. **niko** Chr. is according to STAUDINGER an extraordinary aberration with both wings broadly fuscous margined and the basal part of the forewing brownish. Perhaps accidental, as the yellow of this species is highly susceptible to various kinds of chemical action. — **provincialis** Ob. is a pale, weakly marked form from Provence. — **emaculata** Graes. lacks the apical patch of the forewing. Prevalent in Central Asia, accidental elsewhere. — **mimulina** Btlr. has the cell-mark large, the lines strong, the 2 principal lines of the forewing ending in conspicuous red-brown spots on the hindmargin. N. India: Dharmasala etc. — Egg oval, with fine polygonal reticulation; whitish mottled with red. Larva variable in colour, dirty brown or green, usually resting in a bent position, so that the dorsal hump appears very prominent. On whitethorn, blackthorn and allied fruit-trees, more rarely on other trees. The life-cycle is curious; from hibernated pupae, the moths appear early (generally in April) and produce a 2nd brood about August; the larvae from these latter moths commonly hibernate and do not yield the moths before June. *luteolata* is distributed in Europe, Western and Central Asia. *aestiva*. *flavissima*. *albescens*. *intermedia*. *niko*. *provincialis*. *emaculata*. *mimulina*.

B. Face with projecting scales below; palpus rather elongate.

O. tridentifera Moore (17 h). Cell-spot much larger than in *luteolata*; apical patch wanting; lines represented by red and dark dots on the veins. Described from Sikkim, known also from W. China and Tibet. The name-type has a redder cell-spot than the Chinese form. *tridentifera*.

O. trimacularia Leech (17 h) differs from *tridentifera* in the shape of the markings, in the ♂ also in the presence of a quadrate red patch at the apex of the forewing. W. China and Tibet. *trimacularia*.

O. sulphurea Btlr. (17 h). Easily known by the red basal and distal areas of the forewing, narrowly red hindmargin and very large red cell-spot. I have not seen Palearctic specimens, but ALPHÉRAKY records it from Szechuan. *sulphurea*.

inornataria.

O. inornataria *Leech* (17 h) is almost entirely without reddish markings, though the costal margins of the forewing and the fringes and sometimes the cell-mark have a slight tinge of reddish. The markings are all grey and shadowy. Only the type is known, a ♀ from Che-tou, W. China.

75. Genus: **Stenorumia** *Hmps.*

Differs from *Opisthograptis* in the narrower forewing, with apex somewhat produced, and in having the 2nd subcostal of the hindwing stalked with the 1st radial; forewing with all the veins present, 1st subcostal anastomosing with costal and with 2nd subcostal, 2nd subcostal anastomosing with 3rd—4th. Only some 4 species are known, all N. Indian.

ablunata.*kashmirica*.

S. ablunata *Guen.* (= *pangiaria* *Feld.*) (17 i). Easily recognizable from our figure, which is taken from a rather pale example; some specimens are deeper yellow. The position of the lines varies little. — **kashmirica** *Warr.* is an aberration (?) in which the hindwing is absolutely devoid of markings and the fringes not (as in the name-type) tinged with reddish. — *ablunata* inhabits the N. W. Himalayas (Dharmasala, etc.).

76. Genus: **Heterolocha** *Led.*

Face not tufted. Palpus moderate to long, rough-scaled. Antenna in ♂ bipectinate with long branches. Forewing with apex acute, distal margin oblique, 1st and 2nd subcostals (except in Section B) coincident or (rarely) very long-stalked, anastomosing or connected with the costal, 3rd to 5th arising much before end of cell, 2nd radial (except in Section B) arising before the middle of the discocellulars. Hindwing smooth-margined, discocellulars strongly oblique. An Asiatic genus, most of the species closely related. Section B should almost certainly be removed.

A. Palpus moderate to longish; 1st—2nd subcostal coincident or long stalked, arising from 3rd—5th.

laminaria.

H. laminaria *H.-Sch.* (= *niphonica* *Btlr.*) (18 b) is very variable and as I have before me only the Eastern forms it is not quite certain that the synonymy is accurate. The ♂ figured by HERRICH-SCHAEFFER from Asia Minor must be taken as the name-type, and seems to agree with the form *niphonica*, in which the ground-colour is dull ochreous, so strongly dusted with violet-grey as to appear grey-brown rather than yellowish. — ab. **aristonaria** *Walk.* (figured as *laminaria* ♀ by HERRICH-SCHAEFFER) is bright yellow, little irrorated with violet-grey, though somewhat more so in the distal area. — ab. **bicolor** *ab. nov.* has the median area of forewing and basal part of hindwing clear yellow, the rest strongly violaceous. — N. E. Asia Minor to N. Persia; W. China to Japan.

xerophilaria.

H. xerophilaria *Püng.* differs in its smaller size, narrower wings, very uniform sand-yellow colour, with slight tinge of reddish, and transparent oval white cell-mark of the forewing, in the ♂ with pale reddish, in the ♀ with blackish circumscription. Palestine: Ain-Dschidi (Engedi) in December.

stulta.

H. stulta *Btlr.* (18 a) differs from *laminaria* in its peculiar glossy olivaceous tone, weak markings and very large cell-mark of the forewing. Japan.

fuscofasciaria.

H. fuscofasciaria *Leech.* Smaller and darker than *stulta*, both wings with a complete darker postmedian band. Ichang, one ♂.

phaenicotaeniata.

H. phaenicotaeniata *Koll.* (17 i). Forewing narrower and more acute than in *laminaria*, much lighter yellow, the lines and apical patch more or less overlaid with rosy purple, a large blotch of the same often placed on the posterior half of the postmedian line. — ab. **incolorata** *Warr.* is very pale testaceous, the markings more olivaceous. N. W. Himalayas.

notata.

H. notata *Warr.* is coloured like *stulta* (18 a) but with a rosy flush over the lines. It differs chiefly in having the distal margin of the hindwing straight or almost straight, not rounded. Central China. I follow LEECH'S determination, not having seen WARREN'S type, which may have been a mere aberration of *stulta*.

marginaria.

H. marginaria *Leech* (18 a). This and the remaining species of Section A have also about the shape of *notata*. *marginaria* is distinguished by the rounded orange blotch on the hindmargin of the forewing. Mou-pin, only the type known. Possibly an aberration of the following, which often shows faint indications of the orange blotch.

subroseata.

H. subroseata *Warr.* (18 a). Bright yellow, almost as in *laminaria* ab. *aristonaria*. Generally larger and easily distinguished by its shape. Central and W. China. „Japan“, given by WARREN, is probably erroneous.

falconaria.

H. falconaria *Walk.* (17 i) has the forewing still narrower and more acute, the markings more reddish, apical patch wanting, except generally a red spot in the extreme apex. N. India and W. China.

H. latifasciaria *Leech* (18 a). Not quite so deeply coloured as *falconaria*, markings rather distinct, *latifasciaria*. dark vein-dots on postmedian line well developed, a purplish band distally to this line, especially in posterior half of hindwing. Central China: Chang Yang and Ichang.

H. rosearia *Leech* (18 a). Considerably smaller than *subroseata*, apical patch obsolete excepting the *rosearia*. dark proximal mark, postmedian line more curved, median area narrowed, proximal and distal areas more suffused with rosy. Chang Yang. Also on Formosa.

B. Palpus long; 1st subcostal from cell, 2nd—5th stalked.

H. torniplaga *sp. nov.* (18 a). Nearly allied to the Indian *patalata* *Feld.*, for which LEECH probably *torniplaga*. mistook it. Smaller, 2nd subcostal of forewing stalked to beyond the 5th. Pale ochreous with a slight olivaceous tinge, the costal marks and lines of the forewing merely darker olive-ochreous, an elongate violet-grey patch along hindmargin from postmedian line to distal margin, fringes mostly violet-grey. Hindwing with postmedian line more nearly parallel with distal margin than in *patalata*, the distal area more uniformly violet-grey. Underside much more suffused with violet-grey than in that species. W. China: Ta-chien-lu (type ♂) and Kia-ting-fu (1 ♂) in coll. Brit. Mus.

H. quadraria *Leech* (18 a). Apex less produced, wings more glossy ochreous, with much stronger markings, in part more blackish. Central and W. China.

77. Genus: **Parepione** *Warr.*

Probably related to *Heterolocha*, Section B, most characters the same but with the 1st—2nd subcostal of the forewing arising from the cell, only very shortly stalked, the 1st connected or anastomosing with the costal. Size larger, hindwing with distal margin strongly convex, slightly sinuate between the radialis. From *Epione* it differs in the long palpus. Only one species has hitherto been referred here.

P. grata *Btlr.* Ground-colour almost as bright as in the well-known European species of the *grata*. owing genus, the purplish shading much less developed. Markings as in *lapidea*. — **lapidea** *Btlr.* (18 a) is larger *lapidea*. and duller coloured, but I incline to agree with LEECH that it is nothing more than an aberration of *grata*. Both forms occur in the same localities in Japan.

P. angularia *Leech* (as *Spilopera*) (18 a). Palpus less long, systematic position doubtful (♂ unknown). *angularia*. Its smaller size, brighter colour, ocellated cell-mark, etc., abundantly distinguish it from *grata*. W. China: Kia-tong-fu.

78. Genus: **Epione** *Dup.*

Face with tolerably appressed scales. Palpus shortish or quite moderate. Antenna in ♂ bipectinate, apex simple. Pectus hairy. Femora glabrous. Forewing with distal margin bent in middle; 1st subcostal arising from 2nd, anastomosing with costal, 2nd commonly connected with 3rd—4th. Hindwing with excision in distal margin between the radialis.

Larva rather slender, twig-like, with slight protuberances on the 2nd abdominal segment, the head broad and rounded; feeding on trees in spring and early summer. Only 2 species are known to me, but STAUDINGER has provisionally added a few others. Perhaps the genus is not structurally separable from the American *Euchlaena* *Hbn.*, which would be the oldest name.

E. repandaria *Hufn.* (= *apiciaria* *Schiff.*, *marginaria* *Vill.*) (18 b). Easily known by the acute (in *repandaria*. ♀ falcate) apex, postmedian line ending in or near the apex, little bent in the middle. Sexes alike except in shape. Variable in the strength and extent of the purplish bordering. — The egg hibernates and the larvae hatch very irregularly, over a period of perhaps 8 weeks, so that the moths are on the wing from July to September. — Larva brown, variable in tint, with dark grey longitudinal markings; pale dorsal patches on the abdominal segments, or at least the first 4, containing some black markings and white dots. Chiefly on willow, feeding at night. Pupa moderately slender, blackish brown, strongly glossy. Central and N. Europe and in several localities from the Caucasus to Amurland.

E. vespertaria (*L.?*) *F.* (= *paraellaria* *Schiff.*) (18 b). Apex less produced than in *repandaria*, postmedian line of both wings in ♂ with rather strong, in ♀ with very strong distal projection in the middle, the distal area more strongly red-purple. ♂ with stronger strigulation in the median area than in *repandaria*, ♀ without strigulation and much paler yellowish. — The egg is laid singly on twigs, in rows, and is shaped much like that of *Selenia lunaria*, its colour brown-red with brilliant silvery spots; it hibernates. Larva brown with pale subdorsal and lateral lines, which become indistinct towards the anus; a light dorsal spot on the 3rd abdominal segment, reddish ones on the succeeding segments. It feeds on birch, willow, aspen, etc. The pupa is described as black-brown, probably similar to that of *repandaria*. Moth in June—July. Range similar to that of *repandaria*, but more local.

exaridaria. **E. exaridaria** Graes., founded on a single ♀ from Amurland, has the distal margins strongly waved, but lacks the excision between the radials of the hindwing. Grey-yellow, with greenish grey strigulation, forewing with two almost straight, rather thick yellow-brown stripes, hindwing with one; antemedian accompanied proximally and postmedian distally by a blue-grey line, the distal one broad. The narrow median area of the forewing and the basal part of hindwing lighter than the rest. Distal area with very indistinct broad light band.

limaria. **E. limaria** Chr. (19 a) has not at all the aspect of an *Epione*, but CHRISTOPH says it certainly belongs here. Smaller, apex of forewing acutely produced, distal margin of hindwing smooth, entire; grey, antemedian line of forewing composed of 3 dark spots or dots, discal dot very small, followed by a rather larger dot on the costa at nearly three-fourths; postmedian line double, rather oblique, broken, into spots, divided by a narrow band; hindwing without the antemedian line and yellow band. Transcaucasia: near Ordubad.

emundata. **E. emundata** Chr. (19 a) shows, according to the figure, nearly the shape of *Parepione*, but with the distal margin of the forewing more strongly bent in the middle. Rather smaller than *P. grata*, whitish grey, irrorated with fuscous, the lines fuscous brown, the antemedian nearly straight, postmedian not quite as acutely angled as in *grata*, joined to a similar apical line; cell-dot small. Hindwing whiter, the single line arising much nearer to the anal angle and becoming obsolete about the middle of the wing. Amurland.

magnaria. **E. magnaria** Wileman (18 b) is not a true *Epione* but as its affinities are uncertain I leave it here. 1st subcostal shortly stalked with the others, anastomosing with costal, 2nd long-stalked, anastomosing with first. Shape not characteristic. ♂ unknown. Japan: Nikko, in October.

79. Genus: **Cepphis** Hbn.

Related to *Epione*, but differing as follows. Palpus longer. Antenna in ♂ bipectinate to apex. Forewing with 2nd—5th subcostals stalked, the 5th arising unusually near the apex, always well beyond the 2nd, sometimes even beyond the 3rd. Larva less slender, with 2 minute raised dorsal points near the anal end. The pupa hibernates and not the egg. Only a single species is known; widely distributed in the region.

advenaria. **C. advenaria** Hbn. (19 a). Ochreous whitish, much mixed with deep ochreous; 1st line of forewing sometimes nearly straight, 2nd line with an angle in the middle, posteriorly curved, commonly oblique outwards at hindmargin. Generally not variable. — ab. **fulva** Gillmer is so uniformly irrorated as to appear dark yellow-brown throughout, unmarked except by the discal dots. — Larva variable, purplish grey or olive-brown, abdomen with pale grey dorsal lozenges; 2 pale yellow oblique spots or dashes on the 2nd abdominal; venter more reddish, with dark V-shaped markings. On *Vaccinium* and other low plants. Pupa stout and rugose, not glossy; dorsum and abdomen light brown, wings, legs, etc. greenish. N. Spain, Central Europe and across Central Asia to Japan.

80. Genus: **Hypoxystis** nom. nov.

Face with appressed scales. Palpus rather short, rough-scaled. Antenna in ♂ bipectinate to the apex, the branches not very long. Forewing with costal margin straight, apex acute, distal margin slightly sinuate anteriorly, strongly oblique posteriorly, 1st—2nd subcostal shortly stalked (perhaps occasionally coincident), the 1st anastomosing or connected with the costal. Hindwing large, with costal margin long. HÜBNER'S name of *Hypoplectis* (erected for *pertextaria* and *roraria*) has been misapplied to this genus, which should probably contain only one species, its type *pluviaria*.

pluviaria. **H. pluviaria** F. (= *adpersaria* Hbn. olim, *Stgr. nec F.*, *jacobaearia* Bkh., *inspersaria* Hbn.) (18 b as *advenaria*). Very variable, but recognizable at once by its shape. In the name-typical form the pale ochreous ground-colour shows moderate dark irroration and distinct dark lines. — ab. **punctularia** Lambill. is less irrorated, the lines broken up into dots. — ab. **pallidaria** Lambill. is scarcely irrorated and shows no trace of the lines. — ab. **irroraria** nom. nov. (= *inspersaria* Lambill. nec Hbn.) has dense dark irroration, the lines obliterated. — ab. **obscurata** Lambill. is almost unicolorous black-brown. — **sylvanaria** H.-Sch. is a small, dark, distinctly marked form which is prevalent in S. E. Europe, Finland, etc. — Egg small, elongate, oval; yellowish. Larva slender, tapering anteriorly, yellowish grey or brown with double blackish, yellow-divided dorsal line which thickens into spots on the middle segments, spiracular line broad, whitish, venter usually pale. On *Sarothamnus scoparius*, hibernating nearly full-grown. Pupa rather weak, conico-cylindrical, head and eyes prominent; blackish brown with pale markings. Moth in June, in warm localities earlier. Local in Central Europe, Asia Minor, S. and E. Siberia.

H. henricaria *Ob.* (= *macronata* *Stgr.*) (18 c) is doubtfully referred by STAUDINGER to this genus. *henricaria*. Palpus quite short. Forewing with 1st and 2nd subcostals free. Much smaller than *pluviaria*, long-winged, somewhat recalling an *Osicerda*, but with straight costal margin. Colour variable, brown or grey, upper surface of forewing very weakly marked, hindwing and underside unmarked; a somewhat oblique postmedian line runs towards the apex, is acutely angled above the 1st radial and reaches the costal margin not much beyond the middle; the 3 costal spots are not always present. Algeria.

81. Genus: **Therapis** *Hbn.*

Differs from *Hypoxystis* in the prominent face, longer palpus, pectinations of antenna not reaching to the apex, less elongate wings, the forewing with the 1st and 2nd subcostals free; the hindwing with an excision between the 2nd subcostal and 3rd radial. Only one species known.

T. flavicaria *Schiff.* (18 c). A conspicuous species, bright yellow with the lines weak, but the fore- *flavicaria*. wing with 5 prominent costal spots, dark terminal mark from apex to 3rd radial and dark postmedian blotch at hindmargin. Only with *Pseudopanthera syriacata* could it at first glance be confused and the wing-shape, the ♂ antenna and the underside (which has strong dark red postmedian band and on the forewing apical clouding) are distinctive. — Egg oval, red. Larva rather short and stout, tapering to the small head; greenish, with oblique white lateral stripes. On *Lamium*, *Galeopsis* and other low plants. Pupa brown, the cremaster with a long central spike and on each side a hooked bristle. The moth is double brooded, May and July, 2nd brood specimens smaller and more brightly coloured. Local in S. E. Europe, Transcaucasia and N. Persia.

82. Genus: **Pseudopanthera** *Hbn.*

Differs from *Therapis* in the less prominent face, shorter palpus, simple ♂ antenna, more regular wing margins and very generally in having the 1st subcostal of the forewing anastomosing with the costal. But *himalayica* is intermediate in shape, face and palpus and the *triangulum* group in face and palpus. A small genus, Palearctic and N. Indian.

Ps. himalayica *Koll.* (= *annomosaria* *Walk.*) (18 d as *himalaica*) is distinguished from the following *himalayica*. by its bent distal margins and large spots at middle of costa of forewing and hindmargin of both wings. Dharmasala and Sikkim.

Ps. syriacata *Guen.* (18 c). Upper surface similar to that of *Therapis flavicaria* (see above). Under *syriacata*. surface very coarsely irrorated almost throughout, discal spots large, lines thick. Syria, Asia Minor and Mesopotamia.

Ps. macularia *L.* (18 c). Easily known by having the lines or bands altogether broken up into large, *macularia*. irregular spots. Underside the same. — Only in ab. *transversaria* *Krulik*, are the spots, at least on the fore- *transversaria*. wing, joined into bands. — In ab. *viridimaculata* *Ckll.* the spots are olive-green. — ab. *albicans* *Ob.* has the ground- *viridimaculata*. colour whitish. — ab. *quadrinaculata* *Hatchett* is a rare form with the spots obsolete except the 4 at costal *quadrinaculata*. margin of forewing. — ab. *fuscaria* *Stgr.* (18 c) is another rare form, fuscous throughout. — *meridionalis* *Galvagni*, *albicans*. from Görz and the Southern Tyrol, has less black dusting, the black spots small. — Larva smooth, green, with *quadrinaculata*. white lines and stripes. On *Teucrium* and allied plants. The pupa hibernates. Moth in May—June, flying *fuscaria*. by day. Europe and Asia Minor to Dauria, common. *meridionalis*.

Ps. corearia *Leech* (= *disparata* *Stgr.*) (18 c as *coreata*) differs from the other species in its browner *corearia*. colour and in its scheme of markings, showing on the forewing a strongly curved or bent antemedian line and on both wings a bluntly elbowed postmedian closely preceded by a dark shade; a subterminal series of dark spots usually developed. Ussuri district, Korea, E. China and Formosa.

Ps. (?) invenustaria *Leech* (18 d) differs in neuration, all the 5 subcostals being on a common stalk. *invenustaria*. ♂ unknown, ♀ antenna subserrate. Scarcely yellower than *Hypoxystis pluviaria* and entirely without markings. Korea: Gensan.

Ps. triangulum *Ob.* (19 a) and the 3 following form a natural group, with longer wings, 1st sub- *triangulum*. costal of forewing free. Paler yellowish than *flavaria*, hindwing whitish. As in all the group, the underside has the veins and a coarse irroration or strigulation bright ferruginous-ochreous. Ta-chien-lu, W. China.

Ps. flavaria *Leech* (18 c) is more yellow and lacks the dark streak along the base of the hindmargin *flavaria*. of forewing. W. China: Chow-pin-sa and Pu-tsu-fang.

- oberthüri*. **Ps. oberthüri** Alph. (18 d) differs in the triangular midcostal patch of the forewing and the orange hindwing. W. China.
- lozonaria*. **Ps. lozonaria** Ob. (19 a) recalls an *Eilicrinia* on account of its shape, but has the neuration of *Pseudopanthera*. Less yellow than most of the species, the transverse lines of the forewing weak, arising from triangular dark costal spots; a much larger midcostal triangular spot, confluent with the cell-spot, is shaped as in some *oberthüri*. W. China.
- pulcheraria*. **Ps. pulcheraria** Herz is unknown to me. Shape nearest to that of *lozonaria*, narrower, excisions in distal margin not so deep. Smaller, pale yellow, with 3 brown lines (the postmedian the most distinct), arising from small costal spots; antemedian curved, placed near the conspicuous, elongate dark-brown cell-mark; median arising at two-thirds costa, it and the postmedian parallel, approaching the antemedian at hindmargin. Hindwing with discal dot and postmedian line. Underside strongly irrorated with brown, the lines more sharply expressed, the cell-marks larger. N. Korea, only the ♀ known.

83. Genus: **Calcaritis** Hedem.

Perhaps a subgenus of *Pseudopanthera*. The diagnosis only indicates as differential the pectinate ♂ antenna and the very long inner spurs of the hindtibia, especially the proximal one. Palpus short.

- pallida*. **C. pallida** Hedem. (25 f). Unknown to me. Similar in form and markings to *Ps. syriacata* (18 c), wings perhaps somewhat narrower. Much paler yellow, almost whitish, the forewing with a discal spot and a rather better-developed postmedian band than *syriacata* and some other slight differences. Amurland.

84. Genus: **Eilicrinia** Hbn.

Characters of *Pseudopanthera* but with the 1st and 2nd subcostals of the forewing coincident (perhaps occasionally long-stalked); usually also with a strong anterior excision in distal margin. Larva smooth, slender, with flattened head. A small genus, with the same range as *Pseudopanthera*.

A. Distal margin of forewing with excision (*Eilicrinia*).

- cauteriata*. **E. cauteriata** Stgr. (19 b). Forewing broader than in the other species, more reddish; a dark central line or shade usually present, the other lines broken into dots. Discal dots minute. Andalusia and N. Africa.
- cordiaria*. **E. cordiaria** Hbn. (= *animata* Fisch.-Rösl.) (18 d). Seasonally dimorphic, the name-type, which represents the summer generation, having the ground-colour yellow. The characteristic discal spot is alike in both the forms. — gen. vern. **roeslerstammia** Stgr. (18 d) differs in its cinereous whitish ground-colour. Egg flat, elliptical, light yellow. Larva grey-green with 2 dorsal and 4 subdorsal waved whitish lines, spiracular line white, spiracles red-brown. On Salix, very sluggish. Moth in April—May and July—August, Austro—Hungary, Dalmatia, Asia Minor, Transcaucasia. — **acardia** Stichel is possibly a form of *cordiaria* but entirely without markings. Described from Persia. — **signigera** Btlr. has the discal marks very much narrower, almost linear. Kulu.
- subcordaria*. **E. subcordaria** H.-Sch. (18 d) is similarly dimorphic but differs somewhat from *cordiaria* in shape and is more ochreous, the markings much less dark, lines less dentate, etc. Generally larger. — gen. vern. *anicularia*. (?) **anicularia** Ev. (= *freitagaria* Möschl., ? *tritomata* Fisch.-Waldh.) is the corresponding grey form. Distributed in the mountains of Central Asia.
- nuptaria*. **E. nuptaria** Brem. (19 b). Size of *subcordaria*, colour nearer *cordiaria* but still clearer, more sulphur-yellow. Spots very large, postmedian line regularly dentate, antemedian distinct in its posterior part only. S. E. Siberia and Japan.
- trinotata*. **E. trinotata** Metzner (18 e). Smaller, the cell-mark small, ocellated, the lines fine, arising from dark costal spots. METZNER described from 2 specimens, one pale straw-colour, the other cinereous with fuscous irroration. REBEL restricts the name to the latter form, which occurs in June. — gen. aest. **aestiva** Rbl., occurring in August, is described as „yellow“; the examples before me are whitish ochreous with reddish irroration. The larva is said to have been bred on Silene. Balkan Peninsula to Transcaucasia.
- rosearia*. **E. rosearia** B.-Haas. Unknown to me. Nearest *subcordaria* f. *anicularia* but with the excision in the distal margin less deep, transitional towards the following species. Pale reddish, with a tinge of brown, the postmedian line almost straight, the large discal mark extremely weak. Kashgar.

B. Distal margin of forewing without excision (*Pareilicrinia* Warr.).

E. unimaculata Püng. Rather large and ample-winged, forewing pale brownish grey, central area *unimaculata* somewhat darker, the lines straight, almost parallel, whitish-edged on the reverse sides; discal mark as in *subcordaria* f. *aniculata*. Hindwing, as in that and *rosearia*, more whitish. Palpus stronger than in typical *Eilicrinia*. E. Siberia and Ussuri district.

E. flava Moore (18 d) is even brighter yellow than *nuptaria*, with much smaller discal mark (formed *flava* more as in *trinotata*) and reduced dark patch at distal margin. Best known from Sikkim and Assam, but the British Museum has an example from Chekiang.

86. Genus: **Spilopera** Warr.

Face smooth. Palpus shortish to moderate. Antenna in both sexes simple. Forewing rather elongate, distal margin elbowed or angled at 3rd radial; 1st subcostal arising from cell, 2nd free or shortly stalked with 1st or with 3rd—5th. Hindwing in the type species (*debilis*) almost rounded, in most species bent or angled at 3rd radial. Range: Japan to India. Differs little from *Pseudopanthera* except in shape.

S. debilis Btlr. (18 d). Pale yellowish, the forewing with redbrown subapical patch recalling that of *debilis*. *Eilicrinaria*. The lines are very weak (sometimes obsolete) anteriorly, but their origin is indicated by large olive-fuscous costal spots. Japan, Korea and Chang Yang.

S. gracilis Btlr. (18 e), on which WARREN founds a genus *Pareclipsis*, differs in the angled hind- *gracilis*. wing, browner colour, absence of costal spots, more direct postmedian line, dentate suffusion on both lines, etc. On an average smaller, subapical patch often reduced. Japan and Formosa.

S. crenularia Leech (18 e). Very distinct in the more crenulate distal margins and in the quadrate *crenularia*. pink-centred apical patch of the forewing; perhaps not belonging to this genus. Central China: Chang Yang, only the type known.

S. roseimarginaria Leech (18 f) is equally unmistakable on account of the fine rose-pink border of *roseimarginaria*. the hindwing. Distal margin of forewing more excavated anteriorly than in the typical species. Chang Yang and Omeishan.

87. Genus: **Callerinnys** Warr.

Probably related to *Spilopera* but the face with projecting cone of scales, the palpus longer, distal margin of forewing not or scarcely elbowed, 2nd subcostal long-stalked with 3rd and 4th, arising beyond 5th, 1st subcostal sometimes short-stalked with 2nd—5th, often anastomosing with costal. Range chiefly Indian.

C. obliquilinea Moore (= *straminea* Warr.). The name-typical form does not enter the Palearctic Region and will be dealt with in vol. 12. — **deflavata** subsp. nov. (18 e) differs in having the ground-colour as *deflavata*. far as the 1st postmedian line much paler, being scarcely mixed with the bright ochreous atoms which give to typical *obliquilinea* its colour. Ichang, Central China. Also a larger specimen from Mou-pin, W. China

88. Genus: **Rhynchobapta** Hmps.

Face nearly smooth or slightly tufted below. Palpus longish, 2nd joint rough-scaled. Wings smoothly scaled, somewhat glossy. Forewing with apex acute, minutely produced; 2nd subcostal stalked with 3rd—5th. Hindwing with distal margin more or less prominent at 3rd radial. India to Japan.

A. Antenna in ♂ bipectinate (*Rhynchobapta*).

R. cervinaria Moore (18 f). Purplish grey with a slight ochreous admixture, the lines and discal dots *cervinaria*. sharply expressed, an oblique streak from apex of forewing. N. India and W. China. — **bilineata** Leech is much lighter, more brownish, the lines finer, whiter-edged, the cell-dots minute. Japan.

B. Antenna in ♂ not bipectinate (*Phanauta* Warr.).

R. flaviceps Btlr. (18 e). Smaller than *cervinaria*, much more weakly marked, the postmedian line *flaviceps*. on the forewing somewhat crenulate, fringes white-tipped. Forewing beneath mixed with fulvous as far as the postmedian line. Head yellowish. Distribution similar.

R. punctilinearia Leech (18 e) differs in the position of the lines and in having them broken up into *punctilinearia*. black dots. Kiushiu.

flavicostaria. **R. flavicostaria** *Leech* (18 e). Still smaller, the lines very feeble, the postmedian further from distal margin. Costa of forewing yellow. Founded on a single, not quite perfect ♀ from Ichang, Central China.

eburnivena. **R. eburnivena** *Warr.* (= *albovenaria* *Leech*) (18 e) approximates more to *cervinaria* in size and shape but has the ♂ antenna simple. Face-tuft developed. Very distinct in the white lines and white veins. Japan and Assam.

89. Genus: **Loxotephria** *Warr.*

Face with projecting cone of scales. Palpus moderate, rather stout. Antenna in ♂ minutely ciliated. Femora glabrous. Forewing with apex moderately sharp, distal margin oblique; 1st subcostal arising from costal, anastomosing at a point with 2nd; 2nd radial somewhat before middle of discocellulars; a small fovea. Only 3 species known to me, all with rather gay colouring. W. China, Hainan and Sumatra.

convergens. **L. convergens** *Warr.* (18 f) is characterized especially by the brown subcostal streak of the forewing. The colouring of the upperside is somewhat less bright than in the other species. Underside bright yellow with brown lines and distal marginal clouding except at apex. W. China.

90. Genus: **Macaria** *Curt.*

Face shortly rough-scaled or with small projecting cone. Palpus shortish or moderate, rough-scaled. Antenna in ♂ simple or serrate, ciliated. Femora glabrous or somewhat hairy. Hindtibia in ♂ generally dilated, with hair-pencil, tarsus rather short. Forewing generally with a small excision, or at least faintly sinuous, in the anterior half of distal margin; 1st—2nd subcostal stalked or more often coincident throughout, arising from cell; ♂ with fovea. Hindwing with distal margin angulated in middle, often also with slight crenulations or excisions. — Larva rather slender, without humps, of uniform thickness throughout, head rounded or somewhat heart-shaped. The pupa hibernates.

A very extensive genus, of almost cosmopolitan distribution. Some authors have separated off a number of genera either by wing-shape or by the structure of the ♂ hindleg, but they do not seem to me to be tenable.

notata. **M. notata** *L.* (18 f). Whitish with moderate ochreous-grey dusting, rust-coloured costal patch distally to the postmedian line of the forewing and a dark line round the distal marginal excision; the dark marks distally to the middle of the postmedian line (characteristic of many of the genus) are usually very well developed, but variable. — ab. *innotata* *Fuchs* lacks the latter marks. — ab. *luteolaria* *Tgstr.* is more yellow in colour. — ab. *infuscaria* *Rbl.* is deep yellow-brown, the veins blackish, the dark markings of the distal area confluent and extended. Abdomen black. Recorded from Potsdam and Helsingfors. — Larva green with brown markings on the side, or brown marked with green; head usually black, occasionally green. It feeds in June and July and again in the autumn on birch, willow, etc. Pupa moderately stout, very dark red-brown, the wing-cases with an olive tinge. Distributed in Central and N. Europe, Transcaucasia, Persia, Issyk-kul and parts of Siberia.

alternaria. **M. alternaria** *Hbn.* (18 g as *alternata*). Distal marginal excision deeper, more strongly black-bordered, both wings usually with more violet-grey suffusion, in particular with an ill-defined band distally to the postmedian line. The dark markings at the median branches more irregular, oftener confluent. Antenna in ♂ more strongly serrate. — Egg elongate-oval, somewhat flattened, the reticulation strong. Larva very similar to that of *notata*. On alder, willow, sloe, oak and other trees. Double brooded. Distributed in Central Europe, Transcaucasia, Ili district, Issyk-kul and Amurland.

shanghaiisaria. **M. shanghaiisaria** *Walk.* (= *graphata* *Hedem.*) (25 i). Variable, generally more yellowish than *alternaria*, the angles at the 3rd radial of both wings less strong, the lines generally arising from conspicuous costal spots, the costal spot beyond these generally darker and narrower than in the 2 preceding, the markings at the median branches wanting, the band distally to the postmedian line generally well expressed. ♂ antennal serrations long. S. E. Siberia, Korea, N. China and Japan. HERZ considers it a form of *alternaria*.

signaria. **M. signaria** *Hbn.* (= *cinerata* *Wrbng.*, ? *F.*) (18 g, as *signata*). Distal margin of forewing with scarcely appreciable sinus, tooth at 3rd radial of hindwing not long, ♂ antennal serrations not very long. Very similar to dark-dusted examples of *alternaria*, no black mark at anterior half of distal margin. — Larva green with whitish lines; head reddish. On *Pinus sylvestris*. Pupa slender, blackish brown. Central Europe, the Ural, Altai, Caucasus, N. E. Amurland, etc.; local. Flies in June—July. A very difficult group of closely similar forms in North America.

fuscaria. **M. fuscaria** *Leech* (as *Halia*). Closely similar to the darkest examples of *signaria* but rather narrower-winged, the antennal serrations appreciably longer. The lines in general better expressed, at least on the hindwing, the postmedian often accompanied distally by some pale shading, the dark marks beyond very ill-defined. Japan: Oiwake and Yokohama. LEECH adds Ichang.

M. continuaria *Ev.* is said to be also near *signaria* but much smaller. Dirty white, irrorated with *continuaria*. brown; both wings with 3 brown lines, approximately, but not entirely, parallel with one another and with the distal margin, sometimes darker, sometimes lighter brown, but never very sharply defined; when dark, the 2 outermost are white-edged distally. Irkutsk. Perhaps merely a small race of *signaria*.

M. proximaria *Leech* (= *pryeri* *Btlr.* [praeocc.]) (18 i). Larger and relatively longer-winged than *notata* *proximaria*. and *alternaria*, the rust-coloured subapical spot generally small, always placed from the postmedian, the black marks enlarged and with additional, much smaller ones anteriorly (on each side of 1st radial); postmedian line of hindwing better defined, differently shaped. Antenna in ♂ not serrate. Japan, Korea and China. Should probably sink to the following.

M. normata *Alph.* (25 b) is closely similar to *proximaria* and has the same structure, but with the *normata*. excision in the distal margin rather slight, though there is a well-marked angle at the 3rd radial, postmedian line of forewing rather more sharply angled; the black spots perhaps in general reduced. Amdo district.

M. liturata *Cl.* (18 g). Easily distinguished from all the other species by its ground-colour and by the *liturata*. mixed tawny and rust-coloured postmedian band. Distal margin of forewing not appreciably excised. ♂ antenna serrate. — ab. **nigrofulvata** *Collins* (= *nigra* *Rbl.*) is a fine melanotic form, both wings almost black ex-*nigrofulvata*. cepting the tawny postmedian band. Described from England. — ab. *trexleri* *Schawerda* is less dark than the foregoing, violet-grey, unmarked excepting an ill-defined rust-brown band. — Name-typical *liturata* inhabits the greater part of Europe, Transcaucasia and E. Siberia. — **pressaria** *Chr.* is smaller, cinereous, the lines distinct, *pressaria*. thick, the tawny shade obsolescent except towards costal margin of forewing. N. E. Siberia and N. Amurland. — **deceptans** *Stgr.* is also cinereous or whitish grey, the band more distinctly brownish (on the forewing not *deceptans* yellowish), forewing with 2 or 3 dark spots almost as in *notata*. A mountain form in Italy, Bukowina and Grece. — The larva feeds on *Pinus sylvestris* and is protectively coloured, being green, marked with longitudinal white lines and stripes; head reddish. Grey or brownish forms, with blackish head, occur more rarely. Pupa stout, compact, not very glossy; reddish brown with the wing-cases black-brown, cremaster spiked, without hooklets. *liturata* flies in June and July, a partial 2nd brood in August.

M. temeraria *Swinh.* (18 h). This and the 2 following, together with a few Indian species, form a *temeraria*. rather distinct group, characterized by the clouded distal area, intersected by light veins and crossed by a whitish subterminal line which on both wings reaches the anal angle but recedes from the marginal in the middle of its course, ♂ antenna not serrate, tail of hindwing pronounced. In *temeraria* the black marks on the median branches are very weak or wanting. N. India and Central China to Kiushiu.

M. intersectaria *Leech* (18 h). Similar to *temeraria*, median line regularly curved, preceded by stronger *intersectaria*. dark shades, discal mark of forewing represented by two large dots (spots), black marks on median branches better expressed, subterminal line running to apex (in *temeraria* recurved to costa). W. China: Pu-tsu-fang, 1 ♂.

M. pryeri *Btlr.* (18 g) is distinguished at once by the brighter brown clouding in the postmedian region, *pryeri*. stronger black markings, broader white subterminal line, etc. Japan.

M. cacularia *Ob.* (19 a) belongs to the Indian group which has been called *Gubaria*, with the apex of *cacularia*. the hindwing somewhat excised, a whitish band across the middle of the wings and some large black spots in the distal area of the hindwing. W. China.

M. monticolaria *Leech* (18 f) somewhat approaches *cacularia* in the shape of the hindwing, which in *monticolaria*. addition is appreciably crenulate. Nearest to the Indian *elvirata* *Guen.*, but larger, greyer, less strongly marked. W. China.

M. intermediaria *Leech* (18 h). Smaller and rather browner than the preceding, the postmedian line *intermedia-* fine, less distinctly double, with a less profound curve at the radials of the forewing, median shade stronger. *ria*. Intermediate towards *defixaria*. W. China: Wa-shan and Chia-ting-fu.

M. defixaria *Walk.* (= *zachera* *Btlr.*) (18 h, i). Angle of hindwing sharper than in *intermediaria*, ground- *defixaria*. colour paler, dark spots and suffusions in distal area variable, postmedian line of forewing shaped more as in *monticolaria*, its deep sinus crossed by a faint grey line; very characteristic is a large roundish pale apical spot. Japan and China, generally common.

M. elongaria *Leech* (18 f). Larger than *defixaria*, longer winged, darker, posterior half of postmedian *elongaria*. line of forewing marked with dark spots between the veins, anterior half without the strong distal projection. China: Chekiang and Mou-pin.

M. aestimaria *Hbn.* (18 g as *aestivaria*). In this and the remaining species (except perhaps *ornataria*) *aestimaria*. the distal margin shows no appreciable excision in the forewing but is slightly crenulate or waved, especially

in the hindwing; angle at 3rd radial of hindwing generally weak; ♂ antenna not serrate. *aestimaria* is variable. The name-typical form, which we figure, is moderately variegated and has a wide distribution in the Mediterranean countries and from Asia Minor to N. Persia. — Larva variable, green, with white lines and yellow lateral spots. On *Tamarix gallica*. Moth in April—May and July—September. — *sareptanaria* Stgr. is much more varied with black, recalling *fidoniata* Guen. Sarepta and Syria, also (with transitions to the name-type) Ili and Issyk-kul.

syriacaria. **M. syriacaria** Stgr. (= *venerata* Chr.) (25 c). Closely similar to *aestimaria*, the ♂ antennal ciliation perhaps rather longer, the distal margins less waved. Discal dots on an average smaller, on the hindwing sometimes obsolete, postmedian line on both wings accompanied distally by a dark shade or band, on the hindwing placed further from the cell-dot; otherwise weakly marked, the wedge-shaped blackish markings of the distal area not indicated. Underside much more ochreous than in *aestimaria*, much less variegated than *tenuiata*. — *tenuiata* Stgr. (18 i) is an aberration (perhaps in some localities a race) with the markings still weaker except the postmedian line, which is sharply blackish but does not reach the costal margin of the forewing. Said to be prevalent in Persia and the Zerafshan district. — *syriacaria* is known from Syria, Cyprus, Transcaucasia and Transcaspiia. It is unfortunate that STAUDINGERS name, badly founded, has priority over CHRISTOPHS careful work.

pluviata. **M. pluviata** F. (= *sufflata* Guen., *horridaria* Moore) is a collective species, or group of species, which will require careful anatomical and biological investigation before the exact status of the forms can be ascertained. We can only indicate the chief of them. The name-typical form, which is distributed throughout India, is larger than *aestimaria*, broad-winged (especially the ♀) and in general rather strongly variegated. In it, as in all the forms, the postmedian line of the hindwing is further from the cell-dot than in *aestimaria*, and the underside of both wings much more mixed with ochreous — thus nearer to that of *syriacaria* but much more variegated. On the upperside of the forewing a pale (or even white) patch between the median and postmedian lines and bounded by the two median nervules, and a smaller spot near the apex are always noticeable. Similar (though generally smaller) forms occur as occasional aberrations in the Palearctic Region, as on the Chusan Islands. — *hebesata* Walk. (♀ = *breviusculata* Walk.) (18 g as *pluviata*) is a smaller, less broad-winged form with paler (whitish ochreous) ground-colour, the whitish spots not or scarcely indicated. Distinguishable from *aestimaria* by the less chequered fringes, less traces of a white subterminal line, yellower underside, etc. N. India to Shanghai. — ab. *sinicaria* Walk. only differs from *hebesata* in having strong dark clouding distally to the postmedian line, also near the apex of the hindwing. — *proditaria* Brem. (= ? *flexilinea* Warr.) (18 g) is less pale, less ochreous than *hebesata* (more tinged with violet-grey), smoother-scaled and less variegated than *pluviata*. S. E. Siberia, Chusan Islands, Japan; ? W. China. — ab. *maligna* Btlr. is merely an extreme grey aberration of *proditaria*, founded on a rather large ♀ from Japan.

fuscomarginata. **M. fuscomarginata** Warr. resembles some smooth-scaled forms of *pluviata* (such as *proditaria*) (18 g) but is easily distinguished by the larger discal spot of the forewing, fine yellow proximal edging to the postmedian line and especially by the strong dark violet-grey (on the underside more fuscous and still more extended) shading which occupies a great part of the distal area. Distributed in the N. W. Himalayas—Dharmasala, Kulu, etc.

verecundaria. **M. verecundaria** Leech (18 h) is shaped nearly as the broadest winged *pluviata*, but is rather more brightly coloured, the postmedian line only slightly curved, followed by a slight ferruginous reddish shade, which becomes brighter at the costa of the forewing. Underside pale grey mixed with yellow, densely and coarsely irrorated with fuscous, discal dots and postmedian line well developed, distal area more strongly yellow mixed, a fuscous subterminal band more distinct than above. W. China: Chia-ting-fu. Only the ♀ known.

ornataria. **M. ornataria** Leech (18 i) is a rather small but striking species, with the characteristic black markings large and the principal group almost or quite as strongly developed on the hind- as on the forewing. W. China: Mou-pin and Chungking.

richardsi. **M. richardsi** Prout (18 i as *richardi*). Similar to *ornataria*, distal margins almost smooth, wings with a tinge of fawn-colour, less mixed with whitish, the principal group of black spots smaller, at least on the hindwing, the costal group of the forewing, on the contrary, well developed distally as well as proximally to the pale postmedian line. Underside almost unicolorous ochreous (in *ornataria* strongly variegated). Tientsin, only the type known. Perhaps not separable from the following, which is unknown to me and which I overlooked in describing *richardsi*, on account of its having been erroneously referred to *Lithina* (*Phasiane* Stgr. nec Dup.).

zimmermanni. **M. zimmermanni** Graess. (= *intermaculata* Stgr.) (19 b). Shape of *aestimaria* (hindwing somewhat produced at 3rd radial) colour and markings of upperside apparently as in *richardsi* but with 3 or 4 yellowish or dark lines and perhaps with less dark-dotted costa. Underside whitish instead of bright ochreous, strongly dark dusted, only becoming yellowish towards costa of both wings and each wing with 3 yellow stripes. Amur and Ussuri district. According to REBEL a variety of *biparata*.

M. biparata *Led.* is also closely similar to *richardsi* (18 i) perhaps somewhat larger, the distal margin *biparata*. of the hindwing more waved, more prominent at 3rd radial. Upper surface less uniformly strigulated with brown-grey, hence appearing whiter in places, the dark lines grey, diffuse, the characteristic black pattern of the 2 preceding almost entirely wanting. Underside yellowish, much lighter than in *richardsi*, the median and postmedian lines (or stripes) present. Altai, Uliassutai, Ili and Issyk-kul districts. — **kenteata** *Stgr.*, *kenteata*. referred by its author to *zimmermanni*, seems to me to have more to do with *biparata*. Size and shape about the same, postmedian and subterminal lines accompanied with black markings nearly as in *richardsi* (though apparently variable) hindwing entirely without them; the lines finer. Underside, in the example before me, less yellow. Kentei and Uliassutai districts.

M. frugaliata *Guen.* (= *peremptaria* *Walk.*, *cacavena* *Walk.*, *lineata* *Warr.*). Variable, but easy to *frugaliata*. recognize by its shape and structure; ♂ hindtibia not dilated. Pale ochreous, generally with rather strong. coarse dark irroration or strigulation, a dark band distally to the postmedian and often a second accompanying the median shade; the lines themselves not strong; discal dots small. Throughout India, Dharmasala to Ceylon.

91. Genus: **Krananda** *Moore.*

Structural characters as in *Macaria*, face without projecting cone of scales, palpus short; distal margins in the type species strongly and irregularly crenulate; hindwing with long sharp tooth at end of 2nd subcostal. Wings in part hyaline. Forewing with fovea. A small genus, ranging from N. India to Japan.

K. semihyalina *Moore* (18 h) is distinguished by the hyaline, almost scaleless central area and by *semihyalina*. the arrangement of the black inner-marginal markings. N. India and Japan.

K. lucidaria *Leech* (18 h). Similar to *semihyalina*, the central area not so entirely diaphanous, the *lucidaria*. distal margins not crenulate; black marks in median area of forewing stronger and more regular; postmedian line differently shaped. W. China: Omei-shan.

K. oliveomarginata *Swinh.* (18 l). Smaller than *semihyalina*, basal two-thirds irrorated with pale *oliveomarginata*. olive, distal area mostly olivaceous; postmedian line again differently formed, especially on the hindwing. Khasi Hills and Omei-shan. Also Formosa.

92. Genus: **Trigonoptila** *Warr.*

Like *Krananda* but more thickly scaled, forewing with 1st and 2nd subcostals separate (in *Krananda* stalked or rarely from a point), cell of forewing in general more produced anteriorly, costal vein of hindwing diverging less abruptly from subcostal, distal margins not crenulate. Generally smaller moths than *Krananda*. N. India to China and Formosa.

A. Face with small tuft at lower edge. Palpus moderate. Apex of forewing not falcate (*Trigonoptila*).

T. latimarginaria *Leech* (19 b, c). Unlike any other known species and scarcely variable. The only *latimarginaria*. ♀ before me is rather larger, the posterior half of median area less whitish than in the ♂. Japan, Korea and Chekiang.

B. Face smooth. Palpus short. Apex of forewing falcate (*Zanclopera* *Warr.*).

T. straminearia *Leech*. The only known specimen is in very bad condition. Intermediate in size and *straminearia*. apparently in the shape of the forewing between *latimarginaria* and the Indian *falcata*, hindwing not excavated between apex and the tail at 2nd subcostal. Pale ochreous, costal half of forewing and a common oblique postmedian band somewhat darker, the band marked with dark brown dots on 2nd median and 1st and 2nd submedians of forewing. Chang Yang.

93. Genus: **Coenina** *Walk.*

Face not tufted. Palpus moderate, stout, rough-scaled. Antenna in ♂ bipectinate, with apex simple. Forewing long and narrow, distal margin entire, hindmargin usually somewhat concave; 1st and 2nd subcostals from the cell, free; 2nd radial from before the middle of the discocellulars. Hindwing with costal margin strongly concave in the middle, cut away at apex, distal margin toothed or pointed at 1st subcostal and more or less at 3rd radial and at anal angle. An African genus, or section of the Indo-Australian *Orsonoba*, from which it hardly differs except in the narrow wings and smoother distal margin of forewing.

C. dentataria *Swinh.* (= *aegyptiaca* *Rbl.*) (18 l). Light brown with slight fuscous irroration, especially *dentataria*. in the median area, and angled fuscous lines, the median area with hyaline white spots, variable, but 2

behind the median vein of the forewing and a row, or at least a large one distally to the cell, on the hindwing, particularly noticeable. — Larva rough, the 2nd abdominal segment with a pair of very long, thin, retractile dorsal processes, quite resembling the thorns of the foodplant, *Acacia nilotica*, 8th abdominal with very small humps; reddish grey with some black spots and bright reddish tubercles. Pupa in a slight cocoon in the crevices of the bark, only a short period passed in this state. Principal emergence in June, but there are perhaps 2 or 3 broods. The resting posture resembles that of the Epipleuids, only the hindwing is not so tightly folded round the body. ♂ considerably smaller than ♀. Described from Abyssinia but extends northwards to the Nile Delta (Mansura) and Palestine (Coll. Brit. Mus.).

paulusi.

C. paulusi Rbl. is unknown to me. Antenna of ♂ less closely pectinate, with apex simple, of ♀ dentate, palpus shorter, with small 3rd joint, anal angle of hindwing much less produced, the teeth at 2nd subcostal and 3rd radial stronger, with deeper excision between. 3rd subcostal vein in the ♀ wanting (perhaps an individual variation). Ochre-yellow, forewing with fine, very oblique dark lines at one-third and one-half, the latter sinuous, preceding a row of white somewhat hyaline spots, which is continued on the hindwing. Palestine: Engedi, December and April. Close to *hyperbolica* Swinh., in which the ♀ has the antenna shortly pectinate.

94. Genus: **Hyposidra** Guen.

Face with appressed scales. Palpus rather short, rough-scaled. Tongue short and slender. Antenna in ♂ bipectinate with long branches. ♀ abdomen pointed, with long ovipositor. Forewing in ♂ with fovea. The sexes generally very different in size and shape and even differing in neurulation. ♂ smaller, distal margin of forewing comparatively smooth, though often with strongly produced apex, all veins present, 2nd subcostal usually stalked with 1st, occasionally free, occasionally short-stalked with 3rd—5th. ♀ much larger, distal margins usually more crenulate, sometimes with a deep excision behind the produced apex of the forewing, 1st—2nd subcostal coincident. An Indo-Australian and African genus, scarcely represented in the Palearctic Region.

aquilaria.

H. aquilaria Walk. (= *kala* Swinh., *albipunctata* Warr., *dauidaria* Powj.) (181). A large, dark, not very sharply marked species. The ♀ has at least twice the expanse of the ♂, the apex more strongly falcate. Widely distributed in China; also Sikkim and Shillong.

Note: *falcigere* Btlr. (III. Lep. Het. Br. Mus. 2, p. 45), referred by LEECH to *Hyposidra*, is an *Oberthüria* and has been described in vol. 2, p. 190 as *caeca* ab. *rutilans* Grünb.

95. Genus: **Luxiaria** Walk.

Face smooth. Palpus moderate, rough-scaled. Antenna in ♂ minutely ciliated. Hindtibia in ♂ dilated, with a pencil of hair. Forewing without fovea; apex acute, somewhat produced, 1st—2nd subcostal coincident, free. Hindwing with distal margin variable in shape; cell sometimes short. This genus also is chiefly Indo-Australian but reaches Japan.

A. Hindwing with cell extremely short, distal margin strongly crenulate.

contigaria.

L. contigaria Walk. (181). Variable, but easily recognized by the structural characters. The name-type is yellowish brown in the ♂, paler in the ♀, and has a very wide distribution in the Indo-Malayan Region and W. China. HAMPSON enumerates many synonyms and local forms. — ab. *melanops* Bastelb. is a frequent aberration with a large black spot at the posterior end of the postmedian line of the forewing. — *amasa* Btlr. has a warmer brown ground-colour and darker distal area. Japan, Korea and Central China; not, however, everywhere constant.

B. Hindwing with cell less extremely short, distal margin not crenulate (*Luxiaria*).

consimilaria.

L. consimilaria Leech (181 as *consimilata*). Recognizable by the oblique brown bands on the whitish ground-colour. Postmedian line marked with black vein-dots. W. China: Mou-pin and Omei-shan. Perhaps a form of the Indian *obliquata* Moore.

96. Genus: **Amblychia** Guen.

Face rough-scaled. Palpus moderate, upturned, with dense projecting hair-scales. Antenna in ♂ bipectinate. Hindtibia in ♂ dilated, with strong hair-pencil. Forewing with fovea; apex minutely falcate; 1st and 2nd subcostals free. Hindwing with cell short; distal margin strongly angled at 3rd radial, deeply crenulate from here to the apex. Chiefly Indo-Australian; probably all the forms are referable to one variable species.

angeronaria.

A. angeronaria Guen. (19 h) may be known at a glance by its shape and its gigantic size. In the name-typical form the ♂ is yellowish almost entirely suffused with reddish and fuscous, the ♀ much more yellowish, with conspicuous white apical spot. — ab. *torrida* Moore is wholly reddish-fuscous in the ♂, reddish in the ♀. — Distributed from India to New Guinea, recently recorded from Japan by WILEMAN.

97. Genus: **Lignyoptera** Led.

Face and palpus roughly hairy. Tongue weak. Antenna in ♂ bipectinate with very short branches. Thorax and femora hairy. ♂ with the wings delicate, very glossy, the hindwing relatively large; forewing with 1st subcostal anastomosing with costal. ♀ apterous. Only two species are known, both E. European.

L. fumidaria Hbn. (18 i). Forewing in ♂ dull smoky brownish, the antemedian and postmedian lines *fumidaria* weakly expressed and in the anterior half of the wing only, with a shadowy connection along the median vein. Hindwing grey, unmarked, at the base blackish. ♀ uniform brown-grey, with extremely short, narrow vestiges of wings. The yellowish egg hibernates. The larva is uniformly cylindrical, greenish grey with longitudinal light lines; head flesh-colour. It feeds chiefly on *Achillea millefolium*. Imago from the end of October to December. Lower Austria, Hungary and S. E. Russia.

L. thaumastaria Rbl. is much larger than *fumidaria*, not so strongly hairy. ♂ antenna light ochreous *thaumastaria* yellow. Forewing with short, oblique violet-reddish band at one-third of costal margin and a narrower one at four-fifths curving proximally. Hindwing more yellowish grey than in *fumidaria*, beneath with a broad brown stripe. The ♀ is also light ochreous yellow with longer winglets (the anterior 4 mm. long, pointed). Only known from the mountains of Bosnia and Montenegro. October.

98. Genus: **Theria** Hbn.

Face rather prominent, shortly scaled. Palpus very short. Tongue weak. Antenna in ♂ bipectinate. ♂ with the wings delicate, rather glossy, with long fringes; forewing broad, with all the subcostals stalked, the 1st anastomosing with the costal and then with the 2nd. ♀ nearly apterous. Only one species known, exclusively Palearctic. Probably not so closely related to the following genus as some systematists have supposed; the genitalia, as well as the characters indicated by MEYRICK, justify its separation and the larva also differs in habitus.

H. rupicapraria Schiff. (= *primaria* Haw.) (18 i). The ♂ may be known at once by the large discal *rupicapraria* spot of the forewing and the 2 crenulate dark lines, white-edged on the reverse sides. The rudimentary wings of the ♀ have the apex acute, the forewing bears 2 approximated dark lines, the intervening space often darkened into a band. — ab. *ibicaria* H.-Sch. (= *illataria* Fuchs) is darker, with the lines obsolete. — Egg ellipsoid, *ibicaria* with irregular polygonal reticulation and mostly 10-rayed micropylar rosette; red-brown, the micropylar pole somewhat darker. Larva variable in colour, green or grey, with white or yellow longitudinal lines and with pairs of dorsal dots or dashes at the ends of the segments. Chiefly on blackthorn and whitethorn, May — June. The moth appears in England in January and February, apparently later in Central Europe. It is also recorded from Transcaucasia.

99. Genus: **Erannis** Hbn.

Differs from *Theria* in that the thorax has a small anterior crest, the 1st subcostal vein of the forewing does not arise from a common stalk with the other 4. Antenna in ♂ variable, never (as in *Theria*) with the apical joints pectinated. Forewing often with the distal margin more oblique than in *Theria*. Larva smooth, cylindrical, mostly rather slender (except *leucophaearia*), feeding on various trees in the spring and early summer, generally in abundance and often very destructive. Range: Palearctic and Nearctic.

E. buraetica Stgr. (19 as) is unknown to me and I doubt its belonging to this genus. ♂ antenna quite *buraetica* different, filiform, without ciliation. Forewing as broad as in the broadest *rupicapraria*, apex more pointed; hindwing narrower, with costal margin longer. Forewing light grey with fine dense dark irroration (about as in *Bapta distinctata orientalis*), discal dot present, antemedian line faint, postmedian distinct, oblique, band-like, distally light-edged. Hindwing light grey with faint discal dot and distinct, straight postmedian line, which arises at two-thirds inner-margin and becomes indistinct towards apex. Kentei Mountains.

E. bajaria Schiff. (= *aerugaria* Schiff., *ligustriaria* Lang, *sericearia* Bkh.) (18 i). ♂ antenna bipectinate. *bajaria*. Forewing grey, more mixed with brown in the proximal and distal than in the median area; the latter narrow, the sinuous postmedian line being placed extraordinarily far from the distal margin. ♀ apterous. — ab. **sorditaria** Hbn. (= *kempnyaria* Galv.) is a striking form with whitish ground-colour and darkened basal area *sorditaria* and band between the postmedian and subterminal lines. — Larva moderately stout, grey or brown, ventrally paler, the double dark dorsal line broken on the middle segments into an often very indistinct lozenge-shaped pattern; all the lines more or less whitish-edged. On privet, blackthorn and whitethorn. Moth in October—November, Central and S. E. Europe, Asia Minor, Transcaucasia.

E. erectaria Püng. is considerably larger than *bajaria* (18 i), the wings much longer and narrower, *erectaria*. the 2nd radial vein arising nearer to the 1st, the antennal structure nearly as in *defoliaria*. The 1st line of the

forewing runs slightly curved from the costa at two-fifths to the base of the hindmargin, the postmedian nearly parallel to it, from the costa at three-fourths; median shade present, less oblique, arising near the antemedian, ending near the postmedian. ♀ unknown. East Turkestan: Aksu.

leucophaearia. **E. leucophaearia** Schiff. (= *dira* Btlr., *trilinearia* Sibile) (18 k). Nearest to *bajaria*, forewing of ♂ with distal margin straighter, hindwing with costal margin relatively less long; ground-colour generally whiter. Antennal pectinations shorter, ending in longer cilia. Extremely variable. The type figure (HÜBNER's) is tolerably uniform brown-grey, the basal and postmedian areas only a little browner, all the 3 lines strong. *nigricaria*. ♀ apterous. — ab. **nigricaria** Hbn. (18 k, as *marmorinaria*) has the proximal and entire distal area (except a subterminal line) strongly darkened, the median area light. *marmorinaria* Esp. (a younger name) represents an intermediate form, but need not be separated. — ab. **medioobscuraria** Uffeln has the median area largely filled-in with blackish, especially between median and postmedian lines, basal and distal areas paler. — ab. *ebenica*. **ebenica** Delahaye is a remarkable aberration with black band along the costa, widening into an oval, and some longitudinal reddish marks. — ab. **merularia** Weymer (= *funebraria* Th.-Mieg, *fuscata* Haverkamp) is uniform fuscous brown or blackish. — ab. **nigrilinearia** Leech has the median area much narrowed, with the median vein here broadly black, the whitish subterminal broadened into an ill-defined band which occupies most of the distal area. — Egg long-oval, pointed at one end; light grass-green. Larva rather stout, usually green, with brown dorsal blotches. On oak. Moth from February (or even January) to March or April, Central and parts of S. Europe, Syria, Ussuri district and Japan.

aurantiaria. **E. aurantiaria** Hbn. (= *mellearia* Scharfenb.) (18 k). The ♂ differs from all the other species in its bright golden-brown colour, otherwise closely related to *marginaria*. Antenna (as also in *marginaria*) pectinated similarly to that of *leucophaearia*. ♀ golden-brown, wings extremely short, with 2 dark lines. — ab. **fumipennaria** Hellweger. Forewing infuscated (violet-brown), only the fringe yellow; hindwing also more or less smoky. — ♂-ab. **fasciata** Linstow has a dark band distally to the postmedian line. — Egg flattened at one end, longitudinally ribbed, purplish. Larva slender, brown or blackish dorsally, with ochreous yellow spots on the sides. On oak, birch, hornbeam, etc. The moth emerges in October and the beginning of November and is locally common in Central Europe, etc. Also in the Taurus.

marginaria. **E. marginaria** F. (= *testacea* Retz., *progemmaria* Hbn., *capreolaria* Esp.) (18 k). ♂: less golden than the preceding, with somewhat lighter median area and interrupted subterminal line and whitish hindwing. *diversaria*. Terminal dots conspicuous. ♀ with both wings longer than in *aurantiaria*, elongate posteriorly. — ab. **diversaria** F. (= *rufipennaria* Fuchs) has the forewing uniformly reddish. Lines as a rule normal, in FABRICIUS' type obsolete. — ab. **denigraria** Uffeln has the forewing (♂) infuscated from the base to the median line and from the postmedian nearly to the distal margin. ♀ infuscated in proximal half of wings. — ab. **fuscata** [Mosley] (= *infumata* Fuchs, *uniformata* Fuchs) has both wings strongly infuscated, almost black. Chiefly English. *pallidata*. — ab. **pallidata** Trti. is whitish, „resembling the colour of *ankeraria* as figured by MILLIÈRE“. Lombardy and Sicily. — Egg ovate, greenish, becoming reddish on the upper side. Larva very variable, shaped like the preceding but generally lighter in colour, more yellowish or greenish; a dark subdorsal shade. Melanotic larvae also occur in the same localities as ab. *fuscata*. Polyphagous on deciduous trees. Moth in March—April, in mild seasons beginning to appear earlier. Widely distributed in Europe, the Ural, Caucasus, Taurus, etc.

ankeraria. **E. ankeraria** Stgr. (18 l). ♂: size of *marginaria*, wings broad, delicate, thinly scaled, light brown, discal spot large and oval, lines fine, the postmedian strongly curved at the radials; hindwing white. Antenna dentate, with fascicles of cilia. ♀: similar to that of *defoliaria*, smaller, the dorsal spots more confluent. Hungary.

bela. **E. bela** Btlr. (= *bistriata* Hedem.) (18 l). Colour of *marginaria*, forewing broader, with more pointed apex, postmedian line of forewing almost straight, antemedian usually weak or obsolete. ♂ antenna about as in the following. ♀, according to PRYER, „semi-apterous, like *marginaria*“. Japan and the Ussuri district.

defoliaria. **E. defoliaria** Cl. (= *pulveraria* Hufn. nec L., *discolor* Ström. *bistrigaria* Giorna) (18 l). ♂: longer-winged than *aurantiaria* and *marginaria*, on an average larger, the cell-spot and often the lines blacker, antemedian strongly bent on the fold. Extremely variable, but always recognizable by the shape and by the antenna, each joint of which bears two pairs of fascicles of very long cilia. ♀: apterous, whitish or pale yellowish, dotted with black and with pairs of black dorsal spots. The name-type (♂) has a pale yellowish ground-colour, with indistinct reddish bands accompanying the lines. — In ab. **holmgreni** Lampa (= ? *compressaria* Rothke) (18 k) the bands are wanting. — In ab. **obscurata** Stgr. in addition the ground-colour is darkened (dark reddish brown, in extreme cases almost black). — ab. **progressiva** Haverkamp (= *brunnescens* Rbl.) is brown like *obscurata* but with the bands black. — ab. **obscura** Helfer (= *nigrofasciata* Neuberger) (18 k) has the ground-colour as in the type or sometimes whitish, the bands blackish. — Egg oval with very shallow, somewhat zig-zag longitudinal ridges, a cell-pattern only discernible on high magnification; brownish yellow, without gloss. Larva less slender than *aurantiaria* and *marginaria*, much more gaily coloured; dorsal area variable, red or

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purple, lateral and part of ventral bright yellow. Polyphagous on deciduous trees; next to *brumata* their greatest Geometrid enemy. Moth from November to February, mostly before Christmas. Europe and Armenia.

E. declinans Stgr. ♂ antennal structure as in the 3 preceding. Size of *defoliaria*, forewing somewhat *declinans*. narrower, colour and markings reminding somewhat of *Chesias rufata*. Light ash-grey to dark grey, variable in the strength of the markings. Forewing with basal area sometimes darkened, or with 2 black streaks, median band indistinct, interrupted, often wanting, cell sometimes filled in with blackish; postmedian band brown, well developed, usually bounded proximally by a black postmedian, distally reaching the pale subterminal line. A terminal row of dots or dashes. ♀ apterous, similar to *defoliaria*. Asia Minor; E. Roumelia: Slivno.

E. occataria Ersch. is still almost unknown. Founded on a ♀ similar to that of *defoliaria*, but *occataria*. larger, perhaps greyer, the stumps of wings not quite so minute, dorsal dots of abdomen smaller. Near Samarkand, 27 February.

100. Genus: **Megametopon** Alph.

Unknown to me except from the description. Possibly belongs to the present group. Face extraordinarily protuberant, with an obtuse horny prominence above and 3 horny points at its extremity. Palpus short. Tongue wanting. Antenna in ♂ bipectinate with long branches. Only the type species known. Differs from the Indian *Prometopidia Hmps.* in the pectinate antenna and absence of tongue.

M. piperatum Alph. (25 c). Forewing subacuminate, yellowish cinereous irrorated with grey, the lines *piperatum*. fine, not very sharp, antemedian a little oblique, postmedian sinuous, from middle of hindmargin to three-fourths of costa; subterminal line not very distinct, not lunulate. Hindwing very weakly marked, the lines showing only towards inner margin. Kan-su: Chin-Tassy in July. ♀ unknown.

101. Genus: **Pterotocera** Stgr.

Akin to *Erannis*, differing chiefly in the very long pectinations of the ♂ antenna and that the first 2 segments of the abdomen are strongly spinose dorsally. In the sole example before me I cannot discover a definite thoracic crest. ♀ unknown. Only one species.

Pt. declinata Stgr. Forewing dingy dark grey, with some scattered light ochreous-brown dusting, *declinata*. especially on the veins; subbasal and antemedian dark lines weak, an ill-defined light ochreous-brown postmedian line or narrow band, the veins between this and the whitish, proximally dark-shaded subterminal ochreous-brown. Hindwing lighter grey, unmarked. Forewing beneath shining dark grey with brownish subapical tinge; hindwing with distinct cell-spot. Syr-Daria to the Tarbagatai district. Somewhat recalls *E. declinans* but larger, with quite different antenna, etc.

102. Genus: **Dasypteroma** Stgr.

Founded on 3 bred ♀♀, perhaps not even Geometrid. Legs hairy. Foreleg different from those of all others, the coxa and femur broad, the latter only a little longer than the former; tibia excessively short, with a spine at the end almost as long as itself; 1st tarsal joint very long. The other femora also broad; hindtibia with 4 short spurs. Tongue vestigial. Ovipositor long. Wings linear, hairy anteriorly and posteriorly, scarcely as long as the body.

D. thaumasia Stgr. (19 a). Light wood-brown or brown-grey, with darker spots. Castile: San Ildefonso.

103. Genus: **Phigalia** Dup.

Face hairy. Palpus minute. Tongue short and slight. Antenna in ♂ bipectinate. Pectus hairy. Abdomen spinose. Hindtibia with all spurs present. Wings in ♂ somewhat stronger than those of *Erannis*; forewing with 1st subcostal arising from 2nd, running into costal, or more rarely with the two last-named anastomosing, so that the vestige of 1st subcostal is lost; hindwing with cell elongate, 2nd radial present but rudimentary. ♀ apterous. Larva moderately stout, rugose, with pairs of humps on the abdominal segments, those on the first 2 or 3 segments particularly conspicuous.

Geographical distribution: Palearctic and Nearctic.

Ph. pedia F. (= *pilosaria* Schiff., *hyemaria* Bkh., *plumaria* Esp.) (19 c). ♂ grey with a more or *pedaria*. less strong olivaceous tinge, sometimes mixed with some ochreous or with some whitish scales. The lines variable, thickened and darkened at the margins. ♀ stouter than that of *E. defoliaria*, with longer ovipositor, dorsally more or less brownish, abdomen spinose. — ab. **extinctaria** Stndf. is a paler, almost unicolorous form of *extinctaria*. the ♂. — ab. **monacharia** Stgr. is unicolorous blackish or even quite black. Chiefly from Yorkshire. — The *monacharia*.

larva is brown mottled with ferruginous, frequently with V-shaped ochreous dorsal marks on the 2nd and 3rd abdominal segments. Polyphagous on trees. Moth in January—March, sometimes even in December, well protected on the tree-trunks on which it rests. Central Europe to the Ural, very common.

sinuosaria.

Ph. sinuosaria *Btlr.* (19 c). Very similar to large *pedaria*, the cells longer, lines rather sharply expressed, postmedian of forewing sometimes crossing the cell-spot, then strongly incurved so as to touch the middle line on the fold, first 2 lines of hindwing placed further from base, etc. Japan;? Ussuri district.

verecundaria.

Ph. verecundaria *Leech* (19 c). More slenderly built than the two preceding, more whitish, without olivaceous admixture, recalling weakly marked *titea* *Cram.*, from N. America. Japan, only one example known.

104. Genus: **Chondrosoma** *Anker.*

Head, body and legs exceedingly shaggy-haired. Eye small. Antenna in ♂ bipectinate to apex, with long, thick branches. Abdomen in ♂ short, stout, rather obtuse, spinose. Hindtibia without median spurs. Wings relatively shorter than in the succeeding genera. Forewing with 1st—2nd subcostal coincident, free. Hindwing with 2nd subcostal stalked with 1st radial (very variably); 2nd radial very slender. ♀ wingless, hairy. Only one species known.

fiduciaria.

C. fiduciaria *Anker* (19 b). ♂ wings rather thinly scaled. Known at once by the shape and by the white patches in and behind the cell. ♀ uniform dark brown. — The larva is said to be smooth, green, with yellowish lateral stripe. On Euphorbia. Lower Austria, Hungary and the Tarbagatai district, October—November.

105. Genus: **Apocheima** *Hbn.*

♂ longer-winged than *Chondrosoma*, cells longer (though rather long in all this group of genera), forewing with 1st and 2nd subcostal separate. Thorax broader. Abdomen spinose. Eye normal. Only 4 species known, and even these doubtfully congeneric. One is South African.

hispidaria.

A. hispidaria *Schiff.* (= *ursularia* *Don.*, *tauaria* *Newm.*) (19 b). ♂ forewing brown, dusted and clouded with dark fuscous, thus coloured nearly as in the ♂ of *Lycia hirtaria*, from which it differs in its smaller size, narrower wings, paler and differently marked hindwing, etc. Area distally to postmedian line of forewing generally pale, sometimes strikingly contrasted. ♀ similar to that of *Phigalia pedaria* but larger and with

obscura. more hairy legs, venter and antenna. — ab. **obscura** *Kühne* has the body and wings almost uniform brown-

cottei. black. — **cottei** *Ov.*, from Digne, is larger, more robust, clearer grey (not mixed with ochreous), the markings sharply black. — Larva similar to that of *Phigalia pedaria* but with the humps less developed and without the ochreous V-shaped dorsal marks; variable in colouring. On oak and occasionally birch, hawthorn, etc., May—June. Moth in February—March, rather local in Central Europe, Italy, the Balkans and Dauria.

cinerarius.

A. cinerarius *Ersch.* (19 b). Less yellowish grey-brown than *hispidaria*, easily distinguished by the position and angulation of the dark lines. Hindwing longer and narrower. Antenna, as in *hispidaria*, yellow. Zerafshan, Ferghana, Issyk-kul and Ili.

106. Genus: **Poecilopsis** *Harrison.*

Middle and hind tibiae with the spurs very slender and short, sometimes almost obsolete. The hairy clothing of head, body and legs stronger than in *Nyssia*, including (as in *Apocheima*) the ♀ antenna. Wings more thinly scaled, semitransparent. ♂ forewing with 1st and 2nd subcostals stalked, their stalk commonly longer than in *Nyssia*. ♂ genitalia with „gnathos“ larger and broader, although more pointed, than in the allied genera, not indented at the base; „vesica“ with a band of extremely strong „cornuti“. ♀ wings more pointed than in *Nyssia*, with longer hairs. Larva less smooth and cylindrical than in *Nyssia*, 8th abdominal segment with 2 well-developed warts. Pupa not so stout as in *Nyssia*. Only 3 or 4 species known, Palearctic and Nearctic.

pomonaria.

P. pomonaria *Hbn.* (= ? *grisea* *Thnbg.*, *vertumnaria* *Lef.*, *stigmatella* *Zett.*) (19 c). Wings narrow, the fringes white or whitish, strongly dark-chequered. Thorax and abdomen not quite so robust as in *lapponaria*, with a strong admixture of whitish hair. Collar white. Legs ringed with white. Ground-colour whitish grey, with the veins blackish and a sprinkling of orange scales. ♀ blackish with an admixture of orange scales, the hairs grey. The larva is yellowish grey with orange-yellow collar and segment-incisions and blackish subdorsal and lateral spots. On oak, fruit-trees, etc. The moth appears in March and April and is local in Central

helenae. and North Europe (except England and Holland); ? Asia Minor. — hybr. **helenae** *Harrison* (*pomonaria* ♂ × *N. zonaria* ♀). ♂ very like *zonaria* but more ochreous, the blackish lines and suffusions not so clearly marked.

♀ also nearest *zonaria*, but blacker. — hybr. *hünii* Ob. (*pomonaria* ♂ × *L. hirtaria* ♀). ♂ similar to the reciprocal hybrid *pilzii* (p. 356) but paler, more clearly marked, subterminal line more dentate. ♀ with narrow, acutely pointed wings, unfitted for flight.

P. lapponaria Bsd. (19 d). For the differentiation from *pomonaria*, see above. Body rather robust, *lapponaria* blackish, in both sexes with crown of head reddish ochreous and reddish ochreous dorsal spots, almost confluent (in *pomonaria* this admixture is much slighter and less defined). Wings more black-marked. Egg greenish yellow. — Larva variable, yellow-grey to purple-brown, with yellow lines or stripes. On *Calluna*, *Myrica*, etc.; also on birch. The pupa commonly hibernates twice. Emerges April—May. N. Europe, Silesia, the Alps. — hybr. *smallmani* Harrison (*lapponaria* ♂ × *N. zonaria* ♀). ♂ very like the reciprocal hybrid *merana*, but *smallmani* more weakly scaled, the black markings hence looking greyer, more washed-out. ♀ like that of *merana* but with longer hairs.

P. (?) liquidaria Ev. is said to be very near *pomonaria* but smaller, wings broader at the base, delicate *liquidaria* and very transparent, especially the hindwing; whitish grey, forewing with a broad brown band, bordered by two darker lines, the first oblique, the second parallel to the distal margin. Hindwing almost unmarked. Kirghis Steppes.

107. Genus: *Nyssia* Dup.

Less strongly hairy than *Poecilopsis*, ♀ antenna normal. Tibial spurs normally developed. Forewing with 1st—2nd subcostal short-stalked. Larva smooth, almost cylindrical, feeding on low plants. All the species are Palearctic.

N. zonaria Schiff. (19 d). ♂: variable, but always easy to recognize. Characteristic are the dark veins *zonaria* and broad dark distal area, bounded proximally and traversed by sharply white lines. ♀: distinguished by its yellowish abdominal belts. The rudimentary white wings are common to the genus. HARRISON regards as name-typical the ♂ form with sharply blackish markings, which is prevalent on the Continent. — **britannica** Harrison. Markings greyer, less sharply defined. Britain. — ♂-ab. **obscura** Harrison. Forewing almost *obscura* wholly suffused with black. — **rossica** Harrison. ♂ very small with strong dark markings and line-like sub-terminal band. Ural. — Larva with dorsal area greenish or grey with dark irroration and marbling, an irregular blackish line separating this area from a yellow spiracular stripe. The moth usually hibernates in the pupal shell and emerges in March—April, but a few examples sometimes emerge in the autumn. Central Europe, the Taurus and Caucasus. — hybr. **langei** Harrison (*zonaria*-♂ × *P. pomonaria*-♀). ♂: extremely *langei* like that of *zonaria* but with the markings deeper black; ground-colour not yellowish as in the reciprocal hybrid. ♀ also blacker. — hybr. **merana** Burrows (*zonaria* ♂ × *P. lapponaria* ♀). ♂ marked nearly as in *lap-pomonaria* but with the denser scaling and white ground-colour of *zonaria*. — hybr. **harrisoni** Harrison (*zonaria*-♂ × *L. hirtaria*-♀). The ♂ differs from dark-suffused *hirtaria* in its smaller size, whitish ground-colour, broad white subterminal line and much more sharply marked hindwing, the darkened distal half with white post-median band (though narrow) and white subterminal line recalling *Ithysia*. ♀ wings very narrow and pointed, generally blacker than those of hybrids *hünii* and *pilzii*.

N. incisarius Led. Only known from one ♀. Near *zonaria*, a little smaller. Thorax and abdomen *incisarius* black, the posterior margins of the segments sharply edged with white; head, antenna, body and the rudiments of wings white-haired; legs black, ringed with white. Achalzik.

N. alpina Sulz. (= *bombycaria* Bsd.) (19 d). The ♂ is distinguished by its more shortly pectinate *alpina* antenna, with simple apex. Postmedian line of forewing straight from middle of hindmargin to 3rd radial, then forming a regular curve. Cell-marks mostly large, pale-centred. ♀ easily known by the white face and collar. — ♂-ab. **extincta** Harrison lacks the terminal dark suffusion of the forewing, which is therefore whitish *extincta* from the subterminal line to the margin. — ♂-ab. **tenebraria** Rbl. has both wings almost uniformly black-*tenebraria* grey. — Egg flattened oval, blue-green. Larva green, densely dotted and strigulated with black and with a bright yellow, sinuous lateral stripe. Polyphagous on low plants. Pupa compact, blackish brown, strongly punctured; usually passing two winters. Moth in June at high elevations in the Alps and Tyrol.

N. florentina has been shown by HARRISON to be a distinct species. ♂ genitalia with the valves and *florentina* gnathos quite differently shaped from those of *alpina* and *graecarius*. In wing-markings it is always easily distinguishable by the very oblique course of all the lines on both wings from the inner margin to the 2nd sub-median vein. Antennal pectinations long. ♀ robust, legs strong, wings white, beneath jet black. — *florentina* Stefan., the name-type of the species, is a strongly brown-tinged form with brown thorax and strong markings and suffusions. Florence and Modena. — **italica** Harrison (= *alpinaria* Scriba in err.) (19 d) is grey, only very *italica* faintly mixed with light brown. Thorax grey. N. Italy. — **carniolica** Harrison is also grey, but heavily suffused with blackish scales, markings stronger than in *italica*. Thorax dark grey. Carniola.

graecarius. **N. graecarius** Stgr. (19 d) ♂ antenna intermediate between those of the two preceding, forewing much shorter in proportion to the hindwing, hindwing with apex more rounded, inner margin relatively longer; less glossy, the lines finer than in the allies, postmedian of forewing very near median, bent at 2nd radial so as to run to costal margin nearly at right angles. The name-type, from the Balkan Peninsula, is grey with a tinge of yellowish or brownish. — *istrianius* Stgr., from Istria and S. Carniola, is much whiter, the markings generally weaker. — The ♀ of *graecarius* is less broad than that of *florentina*, more hairy, tips of wings less pointed, their underside mixed with a few white scales, femora and tibiae weak. The larva and life-history are said to be similar to those of *alpina*. Moth in March and April.

108. Genus: **Amorphogynia** Warr.

Intermediate between the preceding genera and *Lycia*. ♂ quite like the latter. ♀ wings shorter than body, with relatively long, pointed hindmargins. Larva shaped nearly as *Biston betularia*. Only one species.

necessaria. **A. necessaria** Zell. (19 d). ♂ similar to that of *L. hirtaria*, median line almost obsolete, subterminal less white. Underside weakly marked. ♀ more grey, with black spots on hindmargin. — Larva yellowgreen, a yellow line above the legs; on Tamarix and other trees. Asia Minor and Transcaucasia, March—April.

inversarius. **A. (?) inversarius** Rbl. is a quite doubtful form, first erroneously recorded as *necessaria*. Only the ♀ known, wings about as long as body, hinder angle produced, but not so sharply as apex. Brownish grey, forewing with a dark line near and parallel with distal margin. Bulgaria. Possibly a hybrid of *L. hirtaria* with some species in which the ♀ is wingless.

109. Genus: **Lycia** Hbn.

General characters of the preceding genera, size larger, ♀ fully winged. Forewing neurulation somewhat inconstant but usually with 1st—2nd subcostal stalked. Larva smooth, cylindrical, as in *Nyssia*. Palearctic and Nearctic.

hirtaria. **L. hirtaria** Cl. (= *eremita* Scop., *atomaria* Hufn. nec L.) (19 e). Variable, the ♀ always narrower-winged and more thinly scaled than the ♂, appearing darker and more weakly marked. The name-type, according to CLERCK's very bad figure and LINNÉ's description, is the grey form, which seems commonest in the ♀. Lines well expressed. — ♀-ab. **terroraria** Krulik. is described as unicolorous grey, with weak traces of the lines on the veins of the forewing. — ♀-ab. **fumaria** Haw. is fuscous or smoky black, in extreme examples entirely unmarked. — **diniensis** Ob. differs little from the name-type, but the lines appear to be very strong and thick. Figured without description. Basses-Alpes. — ab. **fasciata** ab. nov. is a beautiful modification of *diniensis* with the antemedian line double and with a blackish band extending from the median line of the forewing to the subterminal. Le Canadel, Var, France, in my collection. — ab. **flavescens** ab. nov. may be taken as the name of the more yellow-mixed form which is common in England, N. France, etc. — ab. **congeneraria** Hbn. (= *duplicaria* Stgr.) has the antemedian and postmedian lines very distinctly double. Possibly forms a separate race in Algeria. — **istriana** Galv. is a large, whitish-mixed form from Istria. — **hanoviensis** Heymons (19 e) is a small race, more densely scaled, the ground-colour more mixed with ochreous-yellow, the dark markings extended into strong suffusions. In my example the first 2 subcostals are coincident and the lines approach on the hindmargin, giving an impression of a separate species. N. W. Germany. — Egg ellipsoid, micropylar and somewhat concave and granulated; the rest of the surface somewhat glossy, the granulation discernible on strong magnification. Larva generally purplish, with thread-like longitudinal black lines and with yellow marks near the segment-incisions. On lime and other trees. The moth appears in late March or April. Europe, Asia Minor, Issyk-kul, Ili. — hybr. **pilzii** Stndfs. (*hirtaria*-♂ × *P. pomonaria*-♀). ♂: ground-colour very near that of *hirtaria*, but much more suffused with black. Scaling nearly as in *hirtaria*. Basal area and hindmargin of forewing inclined to be lighter, 1st line more bulged. Subterminal band very broad and white. ♀: wings very narrow and pointed, but variable in shape. Colour about as in *hirtaria*. — hybr. **denhami** Harrison (*hirtaria*-♂ × *N. zonaria*-♀). ♂: ground-colour intermediate between that of the parents, slightly nearer *hirtaria* than in *harrisoni*. Wings perhaps slightly broader than in *zonaria*, costal margin as in that species. Markings very variable. This hybrid does not produce ♀♀. — hybr. **buloveci** Harrison (*hirtaria*-♂ × *M. graecarius*-♀). ♂ forewing above similar to heavily marked *hirtaria*, beneath more infuscated, hindwing with median and postmedian lines resembling those of *graecarius*.

101. Genus: **Nyssiodes** Ob.

Close to *Nyssia*, scarcely differing except in the rather smaller eye, extraordinarily long antennal pectinations and somewhat less long and dense hairy clothing. Palpus of moderate length. Hindtibia less

hairy, the pair of spurs moderately long. Forewing with 1st—2nd subcostal coincident. I know only the ♂. The single species is *E.* Palearctic.

N. lefuarius Ersch. (= *olgaria* Ob., *maturaria* Chr.) (19 e). Recognizable at a glance by the fuscous *lefuarius*. borders and the characteristic pale area from base of forewing to near its apex, very light ochreous brown or in its posterior part white. S. E. Siberia, China and Japan.

111. Genus: **Microbiston** Stgr.

Similar to *Chondrosoma*, abdomen less strongly (if at all) spinose, less densely hairy, antennal pectinations more slender, hindtibiae apparently with all spurs, forewing even shorter, all veins present, cell of hindwing longer, 2nd subcostal scarcely stalked. Only the following species known. I believe the above characters are correct, but I have no material for dissection and the extreme hairiness renders examination difficult.

M. lanaria Ev. (= *tartaricus* Stgr.) (19 e). Forewing of ♂ coloured about as in *hispidaria*, the lines *lanaria*. black, often only the postmedian well-defined, blackest (spotted) at costa and principal veins, terminal region pale. Hindwing paler, with dark antemarginal band, postmedian line broken into a few spots or almost obsolete. Underside similarly but somewhat more weakly marked, hindwing with distinct cell-dot. Ural and Central Asia, March—April; ? E. Siberia.

M. turanicus Stgr. is perhaps merely a larger, darker variety of the preceding. Forewing dark brown-grey with 4 partly obsolete blackish lines, hindwing somewhat lighter, dirty grey, mostly with dark discal dots; both wings beneath with 2 distinct dark lines, which are more or less completely wanting in *lanaria*. Transcaucasia.

112. Genus: **Sebastosema** Warr.

Palpus short, hairy. Tongue obsolete. Antenna in ♂ bipectinate to apex. Body and legs hairy. Forewing with 1st—2nd subcostal coincident, arising from a minute areole. Hindwing with costal vein rather far from cell, connected by a slight bar about the middle, 2nd subcostal short-stalked, 2nd radial wanting. ♀ unknown. Established for a Japanese species of very distinct appearance but evidently related to the *Biston* group, though the cells are scarcely more than one-half the wing-length.

S. bubonaria Warr. (19 e). Unlike any other species. Forewing violet-grey with large, round cell-*bubonaria*. mark, black postmedian line and ferruginous submarginal band. Hindwing orange, darker distally, median and postmedian lines black. Japan.

113. Genus: **Zamacra** Meyr.

Face rough-haired, with triangular horny projection. Palpus long-haired. Tongue rudimentary. Antenna in ♂ plumose. Pectus and femora densely long-haired. Hindtibia with terminal spurs only (except *excavata*). Forewing long and narrow, costa straight, 1st—2nd subcostal coincident, anastomosing with costal. Hindwing very narrow, especially in the ♀, costal margin gently concave, 2nd subcostal stalked, 1st median stalked. Larva with strong spines, mostly 5 pairs to a segment, the dorsal pair largest, those on the 6th and 7th abdominals slight. The moth rests in a very curious position, with the forewing rolled up and erected.

A. Hindtibia with 2 spurs (*Zamacra*).

Z. flabellaria Heeger (19 f). Brown-grey with darker irroration, cell-spots and lines. Apex of hind-*flabellaria*. wing very acute. Larva green, with oblique pale subdorsal markings, the spines rose-colour. On Calendula, Senecio, Chrysanthemum, etc., fond of the flower-buds. Pupa stout, cremaster extremely blunt; somewhat rugose but strongly glossy, yellow brown with abdomen more reddish; in a strong earthen cocoon. Moth in the early spring, perhaps again later. Local, S. Europe and N. Africa to the Caspian Sea.

Z. diaphanaria Püng. The ♀ differs from that of *flabellaria* in having more strongly projecting antennal *diaphanaria*. joints. Both sexes with the wings slightly broader distally, the margin more strongly crenulate, that of the forewing less extremely oblique, 1st median vein not stalked, colour browner, 1st line of forewing more regularly curved or bent, followed by some pale shading, median shade broad, forked anteriorly, the space between this and the outer shade on both wings whitish, thinly scaled. Askhabad and N. Persia.

Z. juglansaria Graes. (= *albofasciaria* Leech, ? *okamotonis* Matsumura) (19 e). Different in colouring, *juglansaria*. bright red-brown with whitish postmedian band. Apex of hindwing less acute than in the two preceding. The larva was said to have been found on *Juglans mandschurica*, but as it was compared with that of *Abraxas grossulariata* some confusion must have occurred. Ussuri district and Japan.

B. Hindtibia with 4 spurs (*Acanthocampa Dyar*).*excavata*.

Z. excavata Dyar. (= ? *albofasciaria* Matsumura nec Leech). Evidently similar to *juglansaria* but larger, apex of hindwing more acute, abdomen relatively smaller. Greyish white suffused with fuscous, the red markings more brown, the white band apparently less sharply expressed, antemedian line more bent. Larva green the thorax and last 5 or 6 abdominal segments brown dorsally, some white streaks; thorns white at base, dark at tip, not rosy. On *Morus alba*. Japan.

114. Genus: **Megabiston** Warr.

Close to *Lycia* and *Biston* in structure. Shape and markings more as in *Phigalia* ♂, though the apex of both wings is rather more pointed, especially in the ♀. Antenna in ♂ strongly plumose, as in *Nyssiodes*. Tongue slight. Hindtibia (as in most *Biston*) somewhat swollen distally, with 4 approximated spurs. Cells less long than in most of the group. Larva with head bilobed, body nearly smooth, but with very small raised white elliptical spots on the first 6 abdominal segments, resembling Tachinid eggs. Only one species known.

plumosaria.

M. plumosaria Leech (= *dorriesaria* Warr. nec Chr., *tendinosaria* Dyar nec Brem.) (19 f). Whitish, more or less densely dark dusted, the ♀♀ on an average paler, but both sexes variable. Lines of forewing thickest and deepest black in posterior half, approximated between median and submedian veins. Larva wood-colour, with numerous minute black or brown rings, mostly containing white central dots. On *Thea chinensis*. Japan.

115. Genus: **Biston** Leach.

Head and body less densely hairy than in *Lycia*. Tongue sometimes well developed. ♂ antenna less plumose. Hindtibia usually with all spurs. Wings more densely scaled than in *Lycia*, ground-colour usually white; forewing usually more elongate. Larva with protuberances, at least on the 5th abdominal segment; head rather large, face flat, crown notched. Palearctic, Indo-Australian and Nearctic. The type species, *strataria* Hufn., is nearer to *Lycia* than the other species, agreeing in the more hairy face, weak tongue and the 2-spurred hind-tibia, and is also exceptional in having the ♂ antenna bipectinate to the apex; but the scaling and general aspect and the larva seem to show that GUENÉE'S generic division (here followed) is more natural than LEDERER'S.

nitobei.

B. nitobei Matsumura (= *tripartita* Wilem., *moltrechtii* Ob.) (19 f.) may be placed here provisionally, but probably requires a new genus. Breast as densely hairy as in *Lycia*, abdomen less so; hindtibia with 4 approximated spurs; forewing with distal margin crenulate, call longer posteriorly than anteriorly, hindwing with 2nd radial better developed than usual. Very distinct in the sharp division of the forewing into 3 areas by fine black lines, the antemedian straight. Japan and Sidemi (Manchuria).

strataria.

B. strataria Hufn. (= *prodromaria* Schiff., *marmorata* Sulz.) (19 f, g). A handsome species, very distinct from the following in the longer, narrow hindwing, the brown bands, etc., as well as in the structure.

terrarius.

In the name-type the ground-colour remains white, coarsely dusted with black. — ab. **terrarius** Weymer (= *octodurensis* Favre, *breigneti* Brascassat) has the white areas suffused with yellow-grey, the brown bands wanting, the black lines distinct. Thus transitional towards the following. — ab. **robinaria** Frings (= *nigricans* Ob.) is almost uniform blackish. — **meridionalis** Ob. from S. France is white with sparser dark dusting

robinaria.*meridionalis*.*lis*.

and paler brown bands. — Larva twig-like, with pairs of protuberances on several of the segments, those on the 5th abdominal largest; variable, grey, brown or mottled. On oak, birch and many other trees. The pupa hibernates. Moth in March and April, at rest on tree-trunks by day. Central and parts of Southern Europe; Asia Minor; Transcaucasia. — hybr. **herefordi** (!) Tutt (*strataria* ♂ × *betularia* ♀), so far as yet known, lacks the definite brown bands of *strataria* and is intermediate towards *betularia*.

herefordi.*betularia*.*carbonaria*.

B. betularia L. (= *p-graecum* Poda) (19 g). White, with black lines and cell-marks and coarse blackish dusting. ♀ larger (often much larger) than ♂. — ab. **carbonaria** Jordan (= *doubledayaria* Mill., *nigra* Heyl.) (19 g). Black with a white dot at base of forewing and a few white scales in costal area of hindwing. Men-

insularia.

delian form which is supplanting the type, especially in manufacturing districts. — ab. **insularia** Th.-Mieg is a much rarer, intermediate form, the white ground-colour heavily dotted and mottled with black. — ab.

funebraria.

funebraria Lambill. is a modification of *carbonaria* in which the costal margin of the hindwing remains pure white, traversed by 2 black lines. — ab. **ochrearia** Mansbridge has the ground-colour ochraceous instead of

ochrearia.

white. — ab. **fasciata** ab. nov., has a grey median band crossing both wings (see AIGNER-ABAFI, Ann. Mus. Hungar. vol. 4, p. 527). — **fumosarius** Alph. Ground-colour smoky, the dusting black. Transcaucasia, as a local race.

fumosarius.

Unknown to me, perhaps a variety of *cognataria* with the lines obsolete. — Larva firm, twig-like, with a projection on each side of the 5th abdominal segment. Very variable in colour, green, brown or purplish, etc.,

susceptible to changes in its environment, as shown by the experiments of POULTON. On most trees and even on low plants like *Artemisia*. Pupa robust, dark red-brown or black-brown, hibernating in the ground, almost without cocoon. The moth is common in May—July on tree trunks by day, or at light by night. Europe, Transcaucasia, Altai, Issyk-kul, E. Siberia and Japan.

B. cognataria *Guen.* (= *parva* *Leech* (19 g). Very similar to *betularia*, the white ground-colour in *cognataria*. addition to the coarse black sprinkling bearing a much more minute smoky-brown dusting, which gives to the wings a different tone. Postmedian line of hindwing in general nearer to distal margin, often thickened, less deeply indented at the median veins. Sometimes there are faint indications of brownish bands, giving a remote resemblance to *strataria*. N. India to Japan; also in N. America.

B. robustum *Btlr.* (19 h) differs in its larger size, more brownish tone, yellowish ♂ antenna and especially in the much more variegated underside, which is mottled with brown and white or at least has the costal and distal margins whitish for a greater or less extent. Often — especially in the ♂ — the distribution of the colours on the upper surface more definitely recalls *strataria* than in the preceding species. In the name-type the collar is yellowish. — ab. *albicollis* *Warr.* has the collar white. — Yokohama and Tokio. March—April. *albicollis*. Larva on various species of dwarf oak.

B. tortuosa *Wilem.* (19 g) is also brownish grey, but duller and much more uniform, very much smaller, *tortuosa*. with brownish, not much variegated underside, that of the hindwing having a postmedian line near the cell-spot, not (as in *robustum*) corresponding to that of upperside. ♂ antennal pectinations dark grey. Japan: Oshima and Nikko.

B. fasciaria *Motsch.* is unknown to me, unless it be a banded form of *tortuosa*. Cinereous whitish, *fasciaria*. forewing with a broad blackish cinereous median band, wavy lines and a posterior „lateral“ (? costal) spot. Hindwing beneath with an oblique median stripe. Distal margins above and beneath black-dotted. Japan.

B. huberaria *Ballion* (= *concinna* *Warr.*) (19 g) differs from *betularia* in being almost or entirely free *huberaria*. from black speckling, the antemedian and postmedian lines distinct, black, sometimes accompanied by dark bands; in WARRENS type specimen a median line is also well developed. Underside similarly but less sharply marked. Ili district and Koko-Nor. I have not seen BALLIONS type, from Omsk (W. Siberia) but believe I am safe in sinking *concinna*.

B. hypoleucos *Kusnezov.* Very similar to *huberaria*, considerably smaller, more greyish white, ante- *hypoleucos*. median line less oblique, postmedian with longer projection at radials. Underside pure satiny white, almost markingless except for the discal spot. Ussuri district.

B. thoracicaria *Ob.* (19 g) is unknown to me, but according to STAUDINGER belongs here. It seems *thoracicaria*. to be very near *tortuosa* (perhaps even the same, but less robust, with rather shorter antennal pectinations, more greyish in colour, abdomen with a dark dorsal spot on 2nd segment. Ussuri district and Korea.

B. comitata *Warr.* (= *bloekerii* *Kusnezov*, *regalis* *Leech* nec *Moore*) (19 h). Larger than *huberaria*, *comitata*. the postmedian line forming a broader curve anteriorly; but chiefly distinguished by the brown band at base and on the body (metathorax and base of abdomen) and brown cloudings in distal area. — *jesoensis* *Matsu-jesoensis*. *mura* seems to be an aberration or local form with more conspicuous cell-marks, rather heavier dark markings and some greyish costal suffusion on forewing. — Amurland and Ussuri districts, Ichang and Japan.

B. regalis *Moore* (19 h). Close to *comitata* but sufficiently distinct in its strong suffusion, thicker *regalis*. black lines, etc. Distributed in the Himalayas but perhaps not truly Palearctic.

B. emarginaria *Leech* (19 k) and the species which follow are characterized by their irregularly *emargina-* shaped distal margin and form the genus *Eubyjodonta* *Warr.* *emarginaria* is distinguished by the rather broad *ria*. and not much interrupted brown borders. The white ground-colour is not very heavily speckled. W. China: Pu-tsu-fang.

B. quercii *Ob.* Wings more deeply emarginate, more strongly black-dotted, hindwing with large *quercii*. black cell-spot, borders darker. W. China: Tien-tuen.

B. clorinda *Ob.* is shaped more like *emarginaria* but the brown borders are rather narrower and broken *clorinda*. up into a narrow black-edged submarginal band and some marginal spots. Will perhaps sink to *falcata* *Warr.*, from Darjiling. W. China: Tse-kou.

B. erilda *Ob.* Rather small, distal margins less crenulate, the band and spots more yellow-brown *erilda*. than in *clorinda*, cell-spot of forewing much smaller. W. China: Tse-kou.

116. Genus: **Buzura** *Walk.*

Differentiated by HAMPSON (as Section II of *Biston*) by having the tongue better developed, face less hairy, hindtibia with the median spurs more normally placed, not (as in true *Biston*) close to the terminal or

wanting. ♂ antennal structure much more variable, its apex always simple. Chiefly belongs to the Indian Region, but reaches the Palearctic and Aethiopian.

A. Antenna of ♂ unipectinate (*Amraica* Moore).

superans.

B. superans Btlr. (= *recuraria* Leech) (24a). Recognizable at a glance by its large size, strong build, long uniseriate ♂ pectinations and grey wings, the forewing with brown subapical patch and (except in a few (♀♀) brown basal area. Larva undescribed, except that it is wonderfully stick-like. Has been bred by Dr. Culpin at Shanghai. Distributed throughout China and Japan. Perhaps a greyer race of the Indian *recuraria* Walk.

confusa.

— **confusa** Stgr. is smaller and (especially on the underside) lighter; in my sole example the antemedian line is much more regularly curved and the forewing beneath lacks a dark subapical spot which is always present in *superans*. Koslofska (Ussuri district).

B. Antenna of ♂ bipectinate (*Buzura*).

*suppressa-
ria.*

B. suppressaria Guen. (= *multipunctaria* Walk.) (19 i). White, irrorated almost throughout with brown and black and with 3 (on the hindwing 2) irregular yellow bands. The ♂ also usually with traces of black antemedian and postmedian lines. India and Burma; 1 ♀ labelled „Japan“, ? in error. Has been bred at Dharmasala from larvae on *Dalbergia sissoo*; stick-like, nearly cylindrical, face flat, crown bifid, prothorax with 2 slight dorsal points, penultimate segment slightly raised; brown with indefinite dark dots and spots, showing a tendency to form transverse belts, the eminences and the anterior claspers also darkened. — **bene-**

benescripta.

scripta subsp. nov. from W. China has the black lines present in both sexes, fine, in the ♂ often quite sharp; median yellow band wanting, irroration in the ♂ sometimes comparatively slight. Type (a ♂ from Chungking) in coll. Brit. Mus.

C. Antenna of ♂ subpectinate or serrata, with fascicles of cilia (*Blepharoptenia* Warr.).

thibetaria.

B. thibetaria Ob. (19 h). A very distinct species and not variable. The thick black lines and light brown bands on the white ground, the large, pale-centred cell-mark of the hindwing, the black-belted abdomen and yellow anal tuft are unmistakable. ♂ antenna serrate. Central and W. China.

117. Genus: **Nychiodes** Led.

Palpus short, rough-scaled. Tongue rudimentary. Antenna in the ♂ strongly bipectinate, in the ♀ shortly so. Femora somewhat hairy. Both wings (especially hindwing) with distal margin crenulate. Forewing with 1st—2nd subcostal stalked. Only 2 or 3 species known. Palearctic.

obscuraria.

N. obscuraria Vill. (= *lividaria* Hbn.) (19 i). Very variable geographically, best recognized by the structural characters, though there are but few other species in which the lines are similarly approximated and of like form. The name-type is iron-grey, mixed in places with brown and usually with some narrow

andalusia-

pale shading distally to the postmedian line. Spain and North Africa to Transcaucasia. — **andalusiaria**

ria.

Mill. is smaller, whitish, dusted and strigulated with black. Mountains of Castile. — **ragusaria** **Mill.** (= *bel-*

ragusaria.

liaria Ragusa) is fuscous, the lines weak or obsolete. Sicily. — **dalmatina** **F. Wagner** (19 i) is in general

dalmatina.

more uniform iron-grey, postmedian line of both wings sharply angulated, underside lighter, without discal

phasidaria.

marks. Dalmatia. — **phasidaria** **Rghfr.**, from the Caucasus, is said to be dingy cinereous, with antimarginal

antiquaria

band very faintly brownish. — **antiquaria** **Stgr.** is almost unicolorous grey, mixed with yellowish, an outer

divergaria.

band pale, the forewing without the 1st line. Zerafshan to the Ili district. — **divergaria** **Stgr.** is generally smaller,

the distal margins less deeply crenulate, ground-colour more mixed with pale scales, presenting altogether a very powdery appearance, lines obsolescent, underside paler with larger, more conspicuous cell-dots. Mesopotamia, N. W. Kurdistan and the Southern Taurus. I suspect a separate species. — Larva short and compact, with small head and with dorsal points on the 3rd and 8th abdominals; brown with bright orange-red collar and indistinct dark dorsal lozenges. On *Prunus*, *Erica arborens*, etc., hibernating. Moth in June—July and again in September.

amygdalaria.

N. amygdalaria **H.-Sch.** (19 i) closely resembles *obscuraria* but appears rougher-scaled (probably on account of the coarse black irroration), the antemedian line is still more strongly curved, the postmedian (at least of the forewing) angulated almost as in *obscuraria dalmatina*, on the hindwing placed nearer the distal margin. Hindwing with median line present. Abdomen narrowly white at the incisions. S. E. Europe to Mesopotamia and Palestine.

118. Genus: **Anticypella** Meyr.

According to MEYRICK differs from *Hemerophila* in that the hindwing beneath has a basal fovea. I cannot find this in the examples before me, but maintain the genus as it is certainly no *Nychiodes*. Tongue developed. Forewing with 1st—2nd subcostal stalked, their stalk connected by a short bar with costal.

A. diffusaria *Leech* (= *gigantaria* *Stgr.*) (19 i). Brown with characteristic grey shading proximally *diffusaria*. to the subterminal line. Underside almost unicolorous. Ussuri district and Central China.

119. Genus: **Erebomorpha** *Walk.*

Palpus moderate, rough-scaled. Antenna in ♂ bipectinate. Thorax and abdomen hairy beneath. Hindtibia in ♂ long, dilated, with a ridge of hair. Forewing with a small fovea; distal margin smooth; 1st—2nd subcostal stalked. Hindwing with distal margin toothed at some of the veins. The genus contains only very few species, but these are among the largest of the *Geometridae*. It belongs properly to N. India. The typical section, with ♀ antenna simple, is not represented in the Palearctic Region.

B. Antennae in ♀ binectinata (*Mesastrape* *Warr.* = *Stygomorpha* *Th.-Mieg.*).

E. consors *Btlr.* (24 a). Totally distinct from all other Palearctic species. Probably a local form *consors*. of the Indian *fulguraria* *Walk.*, but with the white markings broader and some other slight differences. Japan to W. China; Korea; Ussuri district.

120. Genus: **Medasina** *Moore.*

Differs from *Erebomorpha* in neuration, the 1st subcostal vein of the forewing arising from the costal, rarely anastomosing with the 2nd subcostal. Variable in shape and some other characters, the hindwing never with the prominent tails of *Erebomorpha*. Size moderate to large. Range chiefly Indo-Australian.

M. scotosiaria *Warr.* (24 b) is a very glossy, dark fuscous species with the lines pale, somewhat sinuous, *scotosiaria*. the postmedian the most characteristic, placed rather near the distal margin, projecting teeth basewards on the veins and somewhat broken basewards at the 3rd radial; the veins in the distal area are also finely pale; sometimes the entire area distally to the subterminal is pale on the forewing. Variable in size, moderate to rather large. Antennal pectinations very long and curved, rather strongly ciliated (forming the type of *WARRENS* genus *Deinotrichia*). Distal margin of hindwing regularly crenulate. W. China: Pu-tsu-fang. Described from Sikkim.

M. albidaria *Walk.* (= *indentata* *Warr.*) is another Indian species which reaches China. Dirty white, *albidaria*. the lines weakly expressed except as 3 costal spots on the forewing (often also a fourth proximally to the origin of the white subterminal), the postmedian line, however, marked by distinct vein-dashes, especially on the hindwing, on the forewing with a dark M-shaped mark from the 3rd radial to the 1st median, usually accompanied distally by a second dark mark. Forewing relatively long. Hindwing crenulate, slightly prominent in the middle. Chang Yang; Omei-shan; Dharmasala.

M. nikkonis *Btlr.* (20 a) differs in its more greyish tone, smaller but blacker costal spots, stronger *nikkonis*. black dashes on the postmedian line, the M-mark not specially developed, hindwing longer and narrower, the distal margin less prominent in the middle. Japan: Nikko.

M. subpicaria *sp. nov.* (20 a). Also white with large costal spots, but larger, broader-winged, the *subpicaria*. lines (except postmedian dots) wanting, the submarginal shades characteristic. Underside white, with large black cell-spots (which show through faintly above), both wings with black costal spots, the apical and marginal (on hindwing subapical and submarginal) patches blacker and better defined than above. Omei-shan (type ♂ and ♀) and Chang Yang, in coll. Brit. Mus. Perhaps a large form of *obliterata* *Moore*.

M. subdecorata *Warr.* (20 a). Smaller, much more densely strigulated with fuscous, lines present, *subdecorata*. cell-spots present, on hindwing large, strikingly black, underside with the black markings more concise. Omei-shan, only one (a ♂) known. Scarcely a form of the preceding, as the wings appear narrower.

M. corticaria *Leech* (20 a). Very distinct, easily known by its large size, and characteristic distal *corticaria*. area with strong dark cloudings and irregularly developed subterminal line — thickest between the 3rd radial and the fold of the forewing. Central China: Ichang and Chang Yang.

M. stolidaria *Leech* (23 a). Again very distinct, recognizable by the fuscous transverse striation on *stolidaria*. the light brown ground-colour and the large costal spots; otherwise the markings are rather indefinite. Central China: Chang Yang; W. China: Ni-tou.

M. differens *Warr.* (20 a) is quite like a *Boarmia* except in the neuration. It may be compared *differens*. with *B. invenustaria* (21 e), but has the lines thicker, more conspicuous brown shades accompanying them, the discal mark of the hindwing is larger, somewhat triangular, obliquely (or almost vertically) placed in relation to the postmedian line instead of parallel to it. W. China: Omei-shan.

121. Genus: **Hemerophila** Steph.

Face with appressed scales. Palpus generally rather short, shortly scaled. Tongue present. Antenna in ♂ bipectinate, apex usually simple. Pectus hairy. Femora not or scarcely hairy. Hindtibia in ♂ generally with hair-pencil. Forewing without fovea; 1st and 2nd subcostals stalked or separate. Hindwing with distal margin crenulate. — Egg with more or less irregular hexagonal positive reticulation, a shining white knob at each angle. Larva twig-like with very slight protuberances, tapering gradually anteriorly. Pupa enclosed in a tough silken cocoon. The genus is widely distributed in Europe, Asia and Africa.

A. Antenna of ♀ not bipectinate (*Hemerophila*).

- japygiaria*. **H. japygiaria** Costa (= *fractaria* Stgr., *rhizolitharia* Rbl.) (20 a). A pretty species and variable but not difficult to recognize. The lines and the shades which accompany them are thicker and deeper black, the antemedian more dentate, the postmedian more sinuous posteriorly. — ab. **barcinonaria** Bell. is a much darker, almost unicolorous dull brown form. — **fidelensis** Mendes also has the ground-colour brownish instead of dirty white or ochraceous. S. Fiel (Portugal). — Egg rather long-oval, finely reticulated. Larva nearly uniform leather-brown with some blackish dots. On olive. Pupa glossy dark brown, in a silver-grey cocoon on the under-side of a leaf, well protected. S. Europe and N. Africa, in a succession of broods.
- lederi*. **H. lederi** Chr. (24 b). Antennal pectinations considerably shorter than in *abruptaria*, wings more greyish, less variegated, the only prominent markings being the lines; postmedian of forewing running to distal margin close to apex, with a shorter but sharper bend between 3rd radial and 1st median. Hindwing weakly marked except at inner margin. Transcaisia: Germob in June. Unknown to me.
- abruptaria*. **H. abruptaria** Thnbg. (= *petrificata* Hbn.) (20 b). Wood-brown with darker brown and fuscous markings, the ♀ generally paler than the ♂. Very characteristic is the pale area at the distal margin of the hindwing — more constant in this species and often more elongate than that of *japygiaria*. — ab. **brunneata** Tutt (= *dalmata* Galv.) has the ground-colour more uniformly of a warm brown. Forms a local race on the Dalmatian Islands. — ab. **fuscata** Tutt (= *unicolor* Tutt *theobromaria* Trti.) is a melanotic aberration, almost entirely or entirely sooty-fuscous or blackish. Not rare in London. — **murina** Ob., from the Maritime Alps, is a greyish form, especially in the ♀, which (according to the figure) is almost violet-grey. — **maura** Ob., from Tunis, is darker grey-brown with fuscous cloudings (not nearly unicolorous, like ab. *brunneata* and *fuscata*). — Egg shiny, reddish, the micropyle placed in a small depression at the broader end, forming a rosette of rounded cells. Larva light brown or grey, variously mottled, very responsive to changes of environment. Feeds chiefly on lilac and privet. The pupa hibernates in a cocoon on the surface of a twig or branch, concealed by gnawed fragments; it is rather long and narrow, moderately smooth, very dark red-brown. Moth April—May, a partial second brood in Ju'y—August. Central and S. Europe, N. Africa and the Brusa district.
- praestantaria*. **H. praestantaria** Püng. Forewing more pointed, hindwing less deeply crenulate. Pale grey, irrorated (in places strigulated) with dull grey-brown; cell-spots distinct; forewing with antemedian line marked by veindots, sometimes connected, postmedian arising not far from the apex, regularly dentate and slightly oblique to hind-margin beyond middle, accompanied by a brownish shade distally; this line continued on the hindwing, nearer to and about parallel with the distal margin. Underside greyer, cellspots stronger, ocellated, postmedian line broken into small dashes on the veins. Pectinations shorter than in *abruptaria*, ♀ antenna shortly serrate. Central Asia: Togus-torau.
- emaria*. **H. emaria** Brem. (20 b). Less variegated than *abruptaria*, the forewing divided by the black lines into 3 areas, the proximal and distal darker, the central pale (varying in breadth). The antemedian line, after running almost straight from near base of hindmargin in the direction of the cell-dot, makes an acute angle basewards in the cell, then becoming obsolete. BREMER describes and figures the species as grey, the examples which I have seen are much more brown. S. E. Siberia; Korea; N. E. China.
- dejeani*. **H. dejeani** Ob. (20 b). Much larger than *emaria*, more richly coloured, the lines somewhat differently formed, postmedian of both wings placed further from distal margin, apex of forewing pale. Very variable, the dark clouding sometimes red-brown, sometimes deep fuscous, in some examples encroaching considerably on the anterior part of the median area. W. China and Hou-kow (Tibet).
- subplagiata*. **H. subplagiata** Walk. (= *retractaria* Walk., *senilis* Btlr., *jugorum* Feld., *lignata* Warr.) (20 b). Still more variable, scarcely larger on an average than *emaria*, rather narrower-winged, coloration showing the same general range as in *abruptaria*, but in addition with some still more variegated forms, in which the basal area and sometimes parts of the costa' are white. Best known by the twice acutely angulated antemedian line. Widely distributed in N. India; Shanghai; Japan.
- conjunctaria*. **H. conjunctaria** Leech (20 b) is rather larger, costal margin of forewing rather more curved, lines thicker, the antemedian curved rather than angled inwards between the two acutely projecting teeth, hind-

wing less variegated, with the line more crenulate, white spots at apex and hinder angle and a dot in the middle. A white band at back of thorax. W. China: Pu-tsu-fang; only the ♀ known.

H. nycthemeraria *Hbn.* (20 b). Testaceous with a rosy tinge, the markings dark brown; costal area *nycthemeraria*. of forewing pale; postmedian line of hindwing almost straight. Underside violet grey, postmedian line with strong black dots (minute teeth) on the veins. Antenna of ♂ bipectinate to apex. — Larva on *Genista*, *Cytisus* and *Juniperus* in March and April; grey, with stronger warts and swellings than that of *abruptaria*. Pupa elongate, dark red, with browner wings; in a slight cocoon. Moth May—August, only known from Valais, S. France and Portugal.

H. serraria *Costa* was scarcely known until recently, when DANNEHL rediscovered it and Count TURATI *serraria*. has published much on it. I have not seen it. Rather large and ample-winged, perhaps as *dejeani* though with more strongly dentate hindwing. Colouring about as in average specimens of *dejeani*, antemedian line more bent outwards, approaching the postmedian, which is strongly bent outwards in middle, then inwards. Postmedian line of hindwing rather near the discal dot. Larva less slender and more uniformly cylindrical than in typical *Hemerophila*, purple-brown with fine yellow lateral lines, anteriorly and on last few segments with dark dorsal stripe. Italy: Genzano (S. of Rome) and Calabria.

H. grummi *Alph.* (24 b). Also large, still broader winged, hindwing only weakly crenulate. Perhaps *grummi*. brighter brown than most *dejeani*, first line weak and incomplete, postmedian still straighter than in *dejeani*, not reaching costal margin, on both wings accompanied distally by a more reddish brown band. S. Ferghana and Issyk-kul. Unknown to me.

H. maderae *B. Baker* (25 d). Aberrant in that the ♂ antennal pectinations are very long and continue to the apex, distal margin of fore- as well as of hindwing definitely crenulate. Otherwise it resembles a rather large, long-winged, brightly coloured *abruptaria* ab. *brunnea*. I have only before me one damaged example and it is said to be variable; the antemedian line seems to curve strongly in the middle and reach the costa nearer the base than in *abruptaria*, but becomes nearly obsolete. Madeira. *maderae*.

H. amphidasyaria *Ob.* (20 c). Aberrant in the same respects as the preceding, though the ♂ antennal pectinations are less extremely long. A large and robust species, probably variable, as the only example before me (a ♂ from Yokohama) has the ground-colour entirely brown, the dark cloudings more restricted, the postmedian line of the hindwing more proximally placed. Ussuri district and Japan. *amphidasyaria*.

H. (?) scalaria *Chr.* is only known to me from the diagnosis. Forewing elongate, subacute, grey-yellowish, with sparse, reddish-grey strigulae, the 2 lines black, obliquely placed, the first dentate on the submedian vein, the outer suberect, obtusely dentate, discal dot and an undulate line fuscous, hindwing paler, with a dot in the middle and a slightly bent postmedian line, a waved fuscous subterminal shade, all the fringes yellowish. Length of a forewing 20 mm. Helenendorf (Transcaucasia). *scalaria*.

H. strictaria *Led.* (20 c) is referred by STAUDINGER to *Synopsia* but the tongue, though not very long, is perfect and the 1st and 2nd subcostals of the forewing are separate. Antenna in ♂ bipectinate to the apex. Easily known by the relatively long hindwing and pointed apex of forewing. Otherwise the approximated lines and the form of the postmedian recall the quite differently shaped *B. solieraria* and one or two other species. — ab. *confluens* *Stgr.* has the lines confluent except at inner-margin, forming a narrow, forked band. — The Ural, the mountains of Central Asia and the Amur-Ussusi district. *strictaria*. *confluens*.

H. dolosaria *Leech* (= oberthüri *Th.-Mieg*) (20 c). This and the following species will perhaps prove to belong to *Gnophos*, but their structure is somewhat intermediate and the early stages unknown. Both are distinguished by the large, more or less ocellated cell-spot and the less oblique lines than in most *Hemerophila*. Except in the cell-spot and darker colour, *dolosaria* resembles the Indian *Hirasa contubernalis* *Moore*, but the lines of the forewing are differently shaped, the postmedian rather more dentate. Chang Yang. Also in Yunnan. *dolosaria*.

H. punctilinearia *Leech* (20 c). Smaller and rather more brownish-tinged, distal margin more oblique, lines more highly crenulate, etc. W. China: Huang-mu-Chang; Kulu. *punctilinearia*.

B. Antenna of ♀ bipectinate (*Phthonandria* Warr.)

H. atrilineata *Btlr.* (= *brunnearia* *Herz*) (20 c). Except in its large size and pectinate ♀ antenna this species much resembles *nycthemeraria*. The ground-colour, however, is deeper brown and the antemedian line is acutely angled inwards on the cell-fold. The eggs are scattered on the back of a leaf of *Morus alba*, on which the larva feeds. Larva twiglike, head rounded, slightly bilobed, brown. True legs large, black lined. Body robust, 5th abdominal segment with a dorsal collar; tubercles of 1st and 5th abdominals elevated, white. Mottled red-brown, blackish and white without definite pattern. An irregular pale dorsal and *atrilineata*.

subdorsal line and white blotches on abdominals 1, 4 and 5. A divided black bar before the collar on abdominal 5, with 3 white dots below tubercle 11. Pupa in a thin cocoon. Japan, Korea, W. China and Dharmasala.

122. Genus: **Synopsia** Hbn.

Characters of *Hemerophila* but with the tongue vestigial. Distal margins less crenulate. Forewing with 1st subcostal shortly stalked with 2nd, anastomosing for a long distance with costal, rarely absent. Larva slender, tapering anteriorly, nearly smooth but with the tubercles large and prominent, especially the posterior trapezoidals of the 5th abdominal. Pupa somewhat elongate, not very glossy. Only one species seems strictly referable to this genus.

sociaria. **S. sociaria** Hbn. (= *fagaria* Wrbg. nec *Thnbg.*) (20 c). Shape and coloration as in *Boarmia* (e. g. some forms of *repandata*), generally with heavy dark shading between the antemedian and median lines of the forewing. The postmedian line is shaped somewhat as in *H. japygiaria* but with stronger projection behind 2nd median. Underside paler, much more weakly marked. — ab. *staudingeraria* Martorell is larger and darker. Bred at Barcelona from *Doryenium*. — *almasa* Schawerda is decidedly smaller, with the black-brown bands more strongly developed. Herzegovina: Mostar. — *unitaria* Stgr. is unicolorous fuscous, less marked, and is the prevailing form at Sarepta and in the Altai. — *propinquaria* Bsd. (= *luridaria* Frr.) is much paler, whitish, less dusted and clouded with fuscous, the lines distinct. The principal form in parts of Spain, but occurs also in S. Russia, Greece, Asia Minor, etc. — Egg oval, ribbed, yellow, later dark purple-red. Larva wood-brown, the blackish dorsal line accompanied on the 1st—6th abdominals with dark streaks and here white bordered; subdorsal line and lateral stripe yellowish white, interrupted. The larva of the form *propinquaria* lighter. On *Spartium*, *Genista*, *Artemisia* and other plants. Pupa blackish brown, the segments lighter. *sociaria* is double brooded and inhabits a wide area in S. and Central Europe and W. and Central Asia.

123. Genus: **Spartopteryx** Guen.

Face smooth. Palpus and tongue short. Antenna in ♂ bipectinate to the apex. Forewing with 1st and 2nd subcostals shortly stalked and continuing approximated, free from costal. ♀ semiapterous, the wings being extremely narrow, almost linear; abdomen robust, with long ovipositor. Only one species known.

kindermannaria. **S. kindermannaria** Stgr. (= *serrularia* Led. nec *Ev.*) (20 d). Characteristically marked, the postmedian line of the forewing twice bluntly bent or curved, then running very obliquely to the hindmargin much before its middle, accompanied distally by a fine white line; subterminal line accompanied proximally by an interrupted dark line or narrow band. Underside more brown, both wings with narrow white postmedian band, hindwing also mixed with white proximally. Distributed in N. W. Mongolia.

124. Genus: **Phaselia** Guen.

Palpus still shorter than in the preceding genera. Tongue obsolete. Antenna in both sexes bipectinate to apex. Thorax with double posterior crest; tegulae short and thick. Hindtibia with terminal spurs only. Abdomen rather long and strong. Wings relatively rather narrow. Forewing with cell very long. Hindwing with costal vein closely appressed to cell to beyond its middle. Only 2 species known, forming an exceedingly distinct genus which STAUDINGER has unaccountably merged in *Synopsia*.

serrularia. **Ph. serrularia** Ev. (= *phaeoleucaria* Led.) (20 d). Recognizable by the serrate brown outer band of the forewing; antemedian line with 3 projections, the one on the median vein at least as strong as that on the fold. Sarepta; W. and Central Asia, June—July. — Larva yellow-green, the head and a broad dorsal stripe red-brown; a short conical dark (dorsal?) point on the anal segment. On *Ephedra distachya* and *Spartium* in May and June. — *narynaria* Ob. is a very large form from Fort Naryn, Turkestan.

deliciosaria. **Ph. deliciosaria** Led. (25 i). Antemedian line of forewing projecting very acutely on fold but not on cell; postmedian approaching distal margin at 1st radial, afterwards extraordinarily sinuous, crossing the *algiricaria*. ill-defined, posteriorly dentate outer brown band. Syria and Palestine. — *algiricaria* Ob. has the projection of the antemedian line still more prolonged, that in the cell almost entirely wanting, the hindwing more weakly marked and some other slight differences. Algeria and once at Albarracin, Spain.

125. Genus: **Boarmia** Tr.

Face generally rough-scaled or with small projecting tuft. Palpus rough-scaled, rarely very short or long. Tongue developed (except in *tenietaria*). Antenna in ♂ bipectinate or ciliate, the apex generally simple.

Thorax hairy beneath. Femora glabrous or slightly hairy. Hindtibia in ♂ generally dilated, with hair-pencil. Forewing nearly always with fovea; 1st—2nd subcostal separate, stalked or coincident. Hindwing with distal margin nearly always waved or crenulate. Larva generally twig-like, frequently with some humps or protuberances.

A very large and cosmopolitan genus or group of genera, very difficult to subdivide satisfactorily although showing considerable variation in structure, chiefly in the secondary sexual characters of the ♂. I have indicated as separate sections a few of the groups which present the most noticeable differences in habitus, and which have been regarded by some noticeable differences in habitus, and which have been regarded by some systematists as genera; the typical section, with pectinate ♂ antenna. I have separated (so far as they are known to me) according to the neurulation, the group *Cleora* corresponding in part to MEYRICKS *Selidosema*, *Boarmia* to his *Diastictis*.

A. Abdomen long, rather robust; ♀ with long ovipositor. Antenna of ♂ strongly pectinate. Wings rather narrow (*Jankowskia* Ob.).

B. athleta Ob. (= *fuscaria* Leech) (20 d). Easily recognized by its shape and coloration. Face rather *athleta*. flat, palpus short. Forewing with 1st and 2nd subcostals widely separate, discocellulars oblique inwards. OBERTHÜRS figure of the underside does not show the usual (though variable) ochreous admixture at the costal margin of the forewing, on which account LEECH failed to recognize the species. Japan and across Palearctic China.

B. Build very robust. Antenna of ♂ plumose, with longish apical part simple. Forewing elongate. Neurulation of *Cleora* (*Phthonosema* Warr.).

B. tendinosaria Brem. (? *Stgr.*) (20 d). A large species, showing somewhat the coloration of *Biston tendinosaria*. *superans* Btlr. (24 a), yet so distinct that I cannot conceive how STAUDINGER has confused the two if he really knew both. Unfortunately he does not notice the antennal structure. *tendinosaria* further differs in having the antemedian not followed by brown costal spot, etc. Japan and Ussuri.

B. serratilinearia Leech (20 e). Similar to *tendinosaria* but rather more violet-grey, ground-colour *serratilinearia*. pale but rather strongly irrorated, antemedian line not black, postmedian finely and regularly dentate, scarcely curved outwards at radials, followed by a conspicuous tawny band, which becomes more rust-coloured at hindmargin. Underside more dusted than in *tendinosaria*, with a vague dark grey costal half-band or shade between the postmedian and the distal margin. W. China: Mou-pin. — *dubitans* Herz (as *superans* var.) is *dubitans*. clearly, according to the description and figure, a form of *serratilinearia*, if not even a synonym. Very slightly broader-winged, the teeth in the postmedian line less marked, the antemedian of the forewing black in its posterior half. Korea and once in Amurland.

C. Build less robust. Antenna of ♂ bipectinate. Forewing with 1st—2nd subcostal separate or short-stalked (*Cleora* Curt. = *Alcis* Hbn.).

B. rimosa Btlr. (20 d) somewhat recalls *tendinosaria* in the scheme of markings, but is in shape and *rimosa*. structure a normal *Cleora* and is further abundantly distinct in its much darker red-brown colour and finer, rather widely separated lines. Japan.

B. charon Btlr. (20 e) is an anomalous species. Fovea small and slight, antennal pectinations short, *charon*. ending in tufts of cilia as in *büttneri*, colour and markings not altogether dissimilar to those of *Nychiodes lividaria* but with a well developed, on the forewing very strongly curved, median line, a dentate whitish subterminal, the postmedian more dentate, etc. Japan and Central China (Chang Yang).

B. solieraria Rbr. (25 c). I do not know the typical form and am not quite satisfied that *harterti* is *solieraria*. the same species. Whitish grey, antemedian line of forewing so oblique as to be almost parallel with costa, obsolete anteriorly to the acute angle, postmedian somewhat sinuous; hindwing with 1 or 2 brown lines in proximal part, which is not dark-strigulated; subterminal line black-edged proximally. Larva on juniper. S. France and Spain. — *harterti* Rothsch. (= *powelli* Ob., as *solieraria* form) is much darker, more brown, *harterti*. postmedian line of forewing very straight; hindwing dark-strigulated from base to postmedian line; subterminal not black-edged proximally. Algeria.

B. powelli Ob. (as *Calamodes*) seems to me likely, according to the figures, to be nearly related to *powelli*. *solieraria*. Larger, more brownish (yet less dark than *harterti*), subterminal line of fore- as well as of hindwing above and beneath with a median line as dark as the postmedian though not reaching the costa but terminating just proximally to the cell-spot. Algeria: S. Oran. Possibly nearer to *bastelicaria* (25 d).

B. haroldi Ob. This and the following may also belong in this vicinity. Light brown with the distal *haroldi*. marginal line finely black. Antemedian line curved near costa, not acutely angled, postmedian rather straight from middle of hindmargin to near apex, then bent at right-angles; subterminal broad, undulate. Hindwing with the 2 dark lines nearly straight, approximated, the postmedian placed very near the discal dot; a pale subterminal on a somewhat darkened distal area. Underside very weakly marked, discal dots large and conspicuous. Larva brown, on juniper. Algeria. Variable in colour.

- haroldaria*. **B. haroldaria** Ob. is somewhat larger, rather uniform pale brown-grey, more weakly marked. Postmedian line of forewing chiefly marked as veindots, on hindwing median, more continuous, placed close proximally to the cell-dot; postmedian line of hindwing more sinuous. Algeria: Sebdu in June.
- terraria*. **B. terraria** B.-Haas, founded on a single ♂ from S. Oran, appears intermediate between *haroldi* and *haroldaria*, as sharply marked as the former but with the lines placed nearly as in the latter, postmedian line of hindwing nearly straight from 1st radial to inner margin. Antennal pectinations somewhat longer than in *solieraria*.
- occitanaria*. **B. occitanaria** Dup. (20 e). Palpus short. Pectinations rather long. Forewing somewhat more pointed, hindwing costally somewhat more elongate than in the most typical *Boarmia*; but GUENÉE, in erecting the genus *Calamodes*, exaggerates the deviation. Whitish, the postmedian line of the forewing characterized by the teeth on the 5th subcostal and 1st radial veins, then incurved, then straight; subterminal line rather straight. Underside more powdered, with large cell-dots, postmedian line marked with dark teeth on the veins. —
- melanaria*. **B. melanaria** Ob. is a much darker form from Géryville, Algeria. Grey, with the basal and distal areas fuscous. — Larva uniformly cylindrical, earth-grey or brown with prothorax more flesh-coloured, an uninterrupted dark grey dorsal stripe (on the middle segments brown). On thyme, hibernating. Pupa smooth, dark reddish, tinged with green on the wing-cases. Moth from August to October. S. and W. France and Spain.
- nobilitaria*. **B. nobilitaria** Stgr. Size of *perversaria*, colour and markings more as in *solieraria*. Light violet-grey, forewing with 2 oblique black lines, antemedian from one-fourth of inner margin, obsolete in anterior half, postmedian parallel with it (and with distal margin), from somewhat beyond middle of inner margin to near costa. Hindwing with the 2 lines somewhat divergent, the proximal weak. Underside somewhat darker grey, almost markingless. S. Ferghana and N. W. Issyk-kul.
- castigataria*. **B. castigataria** Brem. (= *suifunaria* Chr.) (20 e). Quite distinct in the whitish, finely brown-dusted ground-colour, very straight postmedian line of forewing, parallel with distal margin, rust-brown shadings in distal area, etc. Amur and Ussuri district.
- perversaria*. **B. perversaria** Bsd. (20 e). Hindtibia not dilated. Lines formed somewhat as in *rhomboidaria* or *secundaria*, but the wings both above and beneath more smoothly scaled and glossy, light violet-grey, on the upper side with some brown shading, beneath with broad dark border. Larva on Juniper. S. Castile, N. Italy, Valais, Carniola, June—July. — **correptaria** Z. is more reddish, antemedian line more oblique, postmedian more dentate, less pale-edged distally. Dalmatia, Herzegovina, Cyprus and Asia Minor. Larva reddish, the double dorsal line black, the dorsal pattern lozenge-shaped, edged laterally with yellowish white; ventral area yellowish white, with a black dash on each segment. On Cypress in the spring. Moth in May and September. — **subflavaria** Mill. is according to OBERTHÜR a light clay-colour (or yellowish white) race of *perversaria*. Larva exclusively on Genista, similar to that of *rhomboidaria*, partly washed with greenish. Alpes Maritimes.
- abstersaria*. **B. abstersaria** Bsd. (20 e) is according to PÜNGELER a good species near *perversaria*, though it was long supposed to be a form of *rhomboidaria*; more whitish than *rhomboidaria*, sharply marked (at least in the ♀), antemedian line less irregular, underside without the distinct dark apical patch which is generally developed in *rhomboidaria*. Pyrenees. ? Bukovina.
- marcentaria*. **B. marcentaria** Püng. Variable, similarly coloured to the preceding but smaller, narrower winged, postmedian line angled closer to the costal margin. Central Asia: Nia River.
- buxicolaria*. **B. buxicolaria** Mab. (25 d) is unknown to me. It seems to be very near *abstersaria*, if not, indeed, identical. Perhaps rather smaller, pale yellowish grey, the lines somewhat ferruginous. Larva pale yellow with small markings, feeding on *Buxus sempervirens* in February and March. Imago in May, a partial 2nd brood later. S. France.
- bastelicaria*. **B. bastelicaria** Bell. (25 d) slightly resembles the *solieraria-occitanaria* group, but is noticeable for its long palpus, long hindwing, with crenulate distal margin almost as in *Hemerophila*. Rather dark grey, forewing with antemedian line oblique, somewhat curved costally, median line very near it, obsolete anteriorly, postmedian from rather near apex, parallel therewith and crenulate at first, very strongly incurved behind cell, reaching middle of inner margin; cell-dots conspicuous. Postmedian line of hindwing crenulate. Corsica.
- fortunaria*. — **fortunaria** Vazquez is more brownish, the postmedian line of the forewing less deeply curved. Murcia.
- tenietaria*. **B. tenietaria** Stgr. Comparable with *perversaria* (20 e), with some suggestion of *occitanaria* in the shape and markings of the forewing. Light brown-grey, dark-dusted, antemedian line as in *correptaria*, postmedian rather nearer distal margin, median obsolete. A brown shade between the postmedian and the subterminal. Terminal line black, interrupted at the veins. Hindwing without antemedian line, cell-dot distinct. W. Algeria. Aberrant in structure; tongue rudimentary, ♂ antenna bipectinate to apex.
- fascinataria*. **B. fascinataria** Stgr. is very distinct in its strongly dentate (in part zigzag) black lines on the light grey, dark-dusted ground. Forewing with antemedian acutely angled near costa, but somewhat interrupted

at the angle; discal dot large, followed immediately by a blackish, anteriorly dentate median shade; postmedian profoundly dentate, running from near apex and meeting median shade on hindmargin, met near the apex by an oblique black streak from distal margin. Hindwing with large discal dot, followed by curved median line and dentate postmedian. Expanse about 30 mm. W. Algeria.

B. bituminaria *Led.* (25 h) has about the shape of *cinctaria* but is somewhat larger. Smoky grey, not *bituminaria* glossy. Antemedian line of forewing angled near costa, then somewhat oblique, postmedian somewhat as in *cinctaria*, lunulate-dentate, median shade central, distinct but not sharp; a rosin-brown band between the postmedian line and the subterminal; fringe yellowish grey, dark chequered. Hindwing similar. Underside dull smoke-grey, very weakly marked. Altai, Uliassutai, Amur and Ussuri districts.

B. crassestrigata *Chr.* (20 f) would perhaps be better referred to *Hemerophila*, as the fovea is wanting. *crassestrigata*. The name-typical form is easily recognized by its ochraceous or reddish colouring, as well as by the ocellated discal spots. — **discreparata** *Graes.*, said to be the common form in the Ussuri district, is light ash-grey with *discreparata* darker (brownish) bands. — *crassestrigata* inhabits Ussuri, Korea and Japan.

B. büttneri *Hedem.* (= *ochraceata* *Stgr.*, *appositaria* *Herz* nec *Leech*) (20 f) is still brighter ochreous, *büttneri*. more uniform, the lines deep ochreous, median and antemedian less convergent on hindmargin. This species also lacks the fovea and makes such a distinct impression that *STAUDINGER* has referred it to *Angerona* (earlier to *Gonodontis* !); it forms the genus *Heterarmia* *Warr.* The antennal pectinations terminate in tufts of cilia. Amur, Korea.

B. koreana *Alph.* has perhaps about the colouring of *appositaria*, though the incorrect figure looks *koreana*. nearer *büttneri*. Pectinations long. Fovea developed. Lines nearly as in *büttneri*, though the less curved postmedian suggests a relationship with *castigataria*. Distal area more uniformly darkened than in *appositaria*, a complete, dentate pale subterminal. Said to be not uncommon in Korea.

B. appositaria *Leech* (20 f) somewhat resembles *büttneri*, but is by no means so near to it as *LEECH appositaria*. supposed. Antennal pectinations long, not ending in tufts of cilia, fovea developed, neurulation intermediate towards that of the subgenus *Boarmia*, whereas in *büttneri* the 1st and 2nd subcostals are free. Smaller, more brown (not or scarcely ochraceous), distal area irregularly darkened, rendering conspicuous in places the light subterminal line. Kirin (Manchuria), Korea, Chang Yang and Mou-pin.

B. incongruaria *Leech* (20 f) is coloured like the darkest *appositaria* and with the same distal shadings, but has short, stiff pectinations, slighter fovea, 1st—2nd subcostal only quite shortly stalked, wings *incongruaria*. rather narrower, underside and hindwing quite weakly marked. W. China: Omei-shan.

B. montanaria *Leech* (20 f) comes very close to *incongruaria* in shape and structure, but the dark *montanaria*. cloudings are much stronger even than in *appositaria* and it is easily distinguished by the large discal spot of the forewing and the strongly dotted (on the veins) postmedian line of the hindwing. W. China: Omei-shan, Ni-tou and Che-tou.

B. rybakowi *Alph.* is unknown to me, but should be recognizable at once by the ♂ antenna (unless *rybakowi*. *ALPHÉRAKY* has mistaken the sex of his specimen), for the pectinations are said to be very short and are figured as mere lamelles, without ciliation. Otherwise similar to *montanaria* but lighter, greyer brown, the dark cloud less dark, not extending beyond the subterminal line, proximal area and hindwing not clouded. W. China: Oupin (Kan-su).

B. conjungens *Alph.* (20 g). Size, shape and general aspect of *Hemerophila dejeani* *Ob.* (20 b), but with a *conjungens*. fovea. Very like the light, grey-brown, not very strongly banded examples of *dejeani* but with the lines of the forewing placed nearer together, postmedian less oblique, its subcostal projection less long. Amdo district.

B. cinctaria *Schiff.* (= *pascuaria* *Brahm*, *projecta* *Walk.*) (20 f). Very variable, but recognizable in *cinctaria*. most of the forms by the elongate white, often black-ringed cell-marks and the rather strongly curved black antemedian line, preceded (basewards) by a strong, similarly curved fuscous band or thicker line. — ab. **caminiariata** *Fuchs* is unicolorous smoke-colour. — **nigraria** *Rbl.* (= *erebaria* *Krulik.*) is virtually a synonym, representing the most blackened examples. — ab. **submarmoraria** *Fuchs* (= *pascuaria* *Huene* nec *Brahm*) has the median area whitish, the basal and distal areas of the forewing and, to some extent, the distal of the hindwing strongly darkened. — ab. **maculata** *Reuter* is smaller and darker than the name-type, more unicolorous, with the discal spot much larger. — ab. **consimiliaria** *Dup.* (= *consimiliaria* *Rbl.*) lacks the discal marks. The ground-colour is commonly in this form whitish (*lucialata* *Fuchs*), the lines strong, rather widely separated. — ab. **deletaria** *Rbl.* is a strange form, parallel to *Er. leucophaearia* ab. *nigrolinearia*, the distal area mostly whitish, the ordinary markings more or less obliterated, median area of forewing somewhat clouded, with black lines on the veins. — **insolita** *Btlr.*, from Japan and the Ussuri (and ? Altai), would scarcely need separating from *insolita*.

lucialata except on geographical grounds. Whitish, the white cell-mark not or scarcely dark-ringed, subbasal band well developed, postmedian line rather weak except on the veins. Larva smooth, light green with bluish green and white longitudinal lines. On birch, sallow, heath and various other plants. The pupa hibernates and the moth appears in April—May. Widely distributed from Spain to Japan, in the more central latitudes of the Region.

rhomboidaria. **B. rhomboidaria** Schiff. (= *gemmaria* Brahm) (20 g). Violet-grey much shaded with brown and dusted with blackish, the appearing rougher than *perversaria*, which it resembles in the course of the lines. Underside more whitish, very variable in the amount of dark dusting, which tends to become stronger anteriorly and generally forms a dark patch near the apex of the forewing, leaving free a spot at the apex itself and one behind the 3rd radial. — ab. *australaria* Curt. has a strong bright ochreous admixture and sharp markings. I have only seen it from S. England. — ab. *fimbriaria* Steph. is an extraordinary aberration with the ground-colour very light yellow-brown, scarcely dark dusted, the entire distal area of both wings dark fuscous. — *millierata.* ab. *millierata* Gmpbg. is transitional, smoky grey, the lines normal, the entire distal area moderately infuscated, but with the subterminal line, however, indicated. — *perfumaria.* **B. perfumaria** Newman is almost entirely without the brown admixture, the violet-grey ground-colour often darkened. A local race in London, etc., but known as an aberration in France. — ab. *rebeli* Aigner is almost entirely unicolorous, blackish. Traces of a pale outer line usually remain on the forewing. — gen. aest. *minor* Fuchs scarcely differs from the principal form except in the considerably smaller size. — Egg pink, cylindrical, equally suddenly rounded off at both ends, with thick and regular ribs longitudinally and thin sharp ones transversely; the stellate area shows the usual hexagonal pitting, with glowing white knobs at the angles. Larva elongate, twiglike, with slight lateral protuberances on the 2nd abdominal; colour adaptive to the branches on which it rests, sometimes unicolorous, sometimes with dorsal lozenges. Polyphagous, hibernating. Pupa rather slender, deep red-brown, the wings mottled with blackish. Partially double-brooded, common in a great part of Europe, also Syria, Transcaucasia, Persia and the Altai.

psoralaria. **B. psoralaria** Mill. (= *consimilaria* Mill. nec Dup.) is a littleknown species which has been confused with *rhomboidaria* but is clearly distinct, the egg hibernating and the larva lacking the lateral projections. The perfect insect is smaller, more greyish, the abdomen ringed with black; MILLIÈRES figure shows also 2 characteristic dark streaks (costal and subcostal) distally to the subterminal line of the forewing. Larva cylindrical, head flattened in front; clay-coloured, with interrupted brown longitudinal lines, spiracular line rather pale, undulate, continuous; venter partly whitish. On *Psoralea bituminosa*, *Malva* and *Cytisus*, May to the end of July. Cannes.

flavolinearia. **B. flavolinearia** Leech (20 f). A striking species and quite isolated. Antenna of ♂ rather short, with long pectinations, cell of forewing slightly longer than usual. Distinguishable at a glance by the light yellow, ochreous-edged lines. Japan, apparently rare.

nooraria. **B. nooraria** Brem. (25 g). Dirty light yellowish, irrorated with blackish, the lines olivaceous fuscous, the median and postmedian on both wings dentate, parallel, approximated, some dark dusting between them forming a sort of band. Distal area nearly as in the following. Ussuri district.

decoloraria. **B. decoloraria** Leech (20 g). Probably closely related to *nooraria*, which I do not know in nature; it might even be identical but that the postmedian line of the forewing is quite differently formed and the median area not darkened except at the hindmargin of the forewing. Forewing beneath suffused with olive-brownish, distally pale between the veins; hindwing paler, rather uniformly irrorated, the lines very weak; both wings with distinct cell-dot. Central and W. China.

dissimilis. **B. dissimilis** Stgr. (24 c) ♂ unknown. ♀ of the size and shape of the following, grey with dark dusting, without the brown tinge of the allied species; antemedian line of forewing strongly curved outwards, postmedian almost right-angled on 3rd radial, then very strongly incurved, bending outwards again (more strongly than in *secundaria*) at hindmargin. Underside light grey with cell-marks and postmedian line. Ussuri district. ? Japan.

manuelaria. **B. manuelaria** H.-Sch. (25 g). Rather similar to *secundaria*, forewing with distal margin more oblique, colour more olivaceous brown, or even almost green, postmedian line of hindwing fine and generally sharp, placed comparatively near the distal margin. Antennal pectinations slightly fusiform. — ab. *huebneri* *nom. nov.* (= *licaria* Hbn.-Gey. nec Vill.) is darker, less greenish. — Egg elongate, green at first, changing to dark purplish, on strong magnification seen to be marked with longitudinal sulci, the transverse being still slighter. Larva greenish grey with black, lozenge-shaped dorsal markings and oblique dark lateral dashes accompanied by yellowish shading. On oak, probably hibernating, full fed in May or June. Moth in July—August, very local, Spain, Portugal, S. France, W. Germany and Dalmatia.

B. basifasciaria *Leech* (20 g as *basifuscaria*). A rather broad-winged species, very distinct in the strongly *basifasciaria*. sinuous median line and the dark band between this and the antemedian line, continued, though less darkly, to the base. Japan: Oiwake.

B. angulifera *Btlr.* (20 g) has approximately the same markings as *repandata* but is considerably smaller, *angulifera*. median area of forewing mostly pale, proximal and distal areas darkened, subterminal line rather deeply lunulate-dentate, almost parallel with distal margin throughout, strongly dark-shaded proximally. Hindwing rather weakly marked. Forewing beneath with dark distal-marginal band, enclosing light spots at apex and in middle. — ab. *albifera* *Warr.* Median area clear white, without any grey suffusion. Japan, Ussuri district, *albifera*. Korea and W. China.

B. obliquaria *Motsch.* (20 g) differs from *angulifera* in its stronger, more oblique antemedian line, con- *obliquaria*. tinued on the hindwing near the base and as a darkening of the abdomen, much smaller cell-dot of forewing, lighter hindwing and weakly marked underside, without the dark marginal band. Subterminal line bent nearly as in *repandata*. Japan. In the forewing the 1st subcostal arises from the base of the 2nd and anastomoses with the costal; in *angulifera* it is free.

B. grisea *Btlr.* (20 g) bears some superficial resemblance to the two preceding, but is somewhat *grisea*. larger, rather more robust, the antennal pectinations very long. Both wings are smoky grey, the proximal and distal areas tinged with red-brown, the principal lines rather strong and black, postmedian line nearer to distal margin, especially on hindwing. — *albifera* ab. *nov.* has the median area white. Intermediates *albifera*. also occur. Japan and Korea to Central China; ?Omeishan. Neuration of *obliquaria*.

B. mavi sp. *nov.* (20 h). Not quite so long-winged as *grisea*, less robust, pectinations less long. Fore- *mavi*. wing with discal dot smaller, post-median line less strongly bent outwards posteriorly, an almost black cloud on the red-brown distal border. Hindwing with postmedian line much nearer to the cell-dot. Underside less strongly irrorated than in *grisea*, both wings with distal area strongly darkened, hindwing with median and postmedian lines both rather distinct. As in *grisea*, the 1st subcostal of the forewing is shortly stalked with the 2nd and anastomoses shortly with the costal. Suiling, Shen-se, W. China. Type in the British Museum, presented by Mr. WILFRED A. MAW.

B. fortunata *Blachier* (= *obscura* *B. Baker*, *büchlei* *Kilian*) (20 h) is a very distinct species. Face *fortunata*. rather prominent, palpus strong, with projecting scales. Forewing not broad, distal margin less oblique than usual, scaling dense and rough. Very variable, the large light blue-grey or whitish grey discal spot generally characteristic. Underside smooth-scaled, somewhat smoky, both wings with dark discal spot (on forewing large), thick curved postmedian line and dark border. The name-type is taken to include all the more variegated forms. — *wollastoni* *B. Baker* is more unicolorous, grey. — *fortunata* inhabits the Canary Islands and Madeira. *wollastoni*.

B. secundaria *Esp.* (20 h) somewhat recalls small, sharply marked *rhomboidaria*, though the antennal *secundaria*. pectinations are considerably longer. Among other differences may be mentioned the generally whiter ground-colour, the more conspicuous whitish spot at middle of distal margin and the differently formed postmedian line, which is less angularly broken anteriorly and curves outwards at the posterior margin. — ab. (gen. aest., pr. p.) *aterrima* *Hormuz.* is a strongly darkened form, blackish brown, distally without white admixture, lines *aterrima*. weak. Bukowina; ?Greece. — Larva tapering anteriorly, red-brown, with dark dorsal lozenges and yellow lateral spots. On *Pinus sylvestris*, hibernating. Pupa red-brown. Imago in pine-woods, July and August. Distributed in Central and parts of S. Europe, wanting in the West. — *fallentaria* *Stgr.* is whitish-ashy or grey, not *fallentaria*. brownish. Taurus.

B. simpliciaris *Leech* (= *lectonia* *Swinh.*) (20 h). I cannot understand how LEECH can have described *simpliciaris*. this as a variety of the preceding, except that the underside is similar. Besides being less sharply marked it differs essentially in the postmedian line, which lacks the tooth on the 1st radial and the strong inward curve in the posterior part. Japan. — *faustinata* *Warr.* (= *praepicta* *Warr.*) is a lighter violet grey or whitish *faustinata*. form with comparatively slight dark dusting. W. China and as an aberration in Japan. — Neuration as in *obliquaria* (in *secundaria* it is as in *angulifera*).

B. ribeata *Cl.* (= *abietaria* *Schiff.*) (20 h) is distinguished structurally from the other European *ribeata*. species by the absence of the fovea (genus *Deileptenia* *Hbn.*, [*Meyr. restr.*]), but is also quite easy to distinguish by its shape and markings. The name-typical form is brown-grey with an olivaceous admixture, usually with a characteristic row of fuscous spots proximally to the subterminal line. — ab. *sericearia* *Curt.* is glossy *sericearia*. blackish, with the markings only weakly indicated. Extreme examples are absolutely unicolorous. England. — Larva rugose, the tubercles placed on minute protuberances; grey-brown or ochreous brown, with pale dorsal patches. On yew and other Coniferae, oak, birch, etc.; hibernating. Moth in July and August. Central Europe; Russia; Japan.

- songaria*. **B. songarica** *Alph.* (= *subfuscaria* *Stgr.*) (20 h). Build slender, face smooth, antennal pectinations not very long; 1st and 2nd subcostal of forewing free. Characterized by the mottled, brownish or sandy colouring and the obsolescence of the lines, which are scarcely indicated except as costal spots and vein-dots; subterminal line dentate, thick, rarely very distinct, strongly bent proximally in the middle, in part dark-shaded proximally. Underside still more weakly marked. Ili district and Issyk-kul, probably also Zerafshan and other localities in Central Asia. — **variolaria** *Stgr.* is probably a form of *songarica*, differing chiefly in its very distinct coloration. The ground-colour is whitish grey very strongly dusted with dark smoke-brown, so as to appear predominantly dark-coloured. The lines are sometimes distinct, sometimes obsolescent, the characteristic subterminal line very conspicuous, white. Ferghana.
- umbraria*. **B. umbraria** *Hbn.* (20 h) resembles *rhomboidaria* but is much more strongly black-marked above and beneath and sometimes attains a great size. The median line of the forewing, which in *rhomboidaria* is bent round distally to the cell-spot, in *umbraria* is placed proximally to or sometimes crosses it. Underside characteristic, all the lines and some dark spots well expressed on a light ground. — ab. **decoasteraria** *Ob.* is much suffused with blackish, especially on the forewing. — **powelli** *Ob.*, from Algeria, is a smaller form, with the ground-colour rather uniformly greyish or brownish, the white patches of the type almost entirely suppressed. Markings normal. — Larva closely similar to that of *rhomboidaria*, generally of a slightly vinous grey-brown; in addition to the lateral protuberance on the 2nd abdominal it bears a slight, elongate, oblique one on the 1st. On olive, hibernating. Moth in two broods, distributed from the Mediterranean lands to Transcaspia.
- mandchuriaria*. **B. mandchuriaria** *Brem.* (= *dembowskiaria* *Ob.*) (20 h) is very variable, but unmistakable on account of its white ground-colour and blackish markings. According to MEYRICK it agrees in structure with *ribeata*. Amur and Ussuri district.
- venustaria*. **B. venustaria** *Leech* (20 i) is evidently related to the *acaciaria* group of the Indo-Australian and African Regions (*Chogada* *Moore*), the build, shape and pattern recalling *selenaria*, the ♂ antennal structure rather characteristic, the pectinations, though long, ceasing rather abruptly at about one-half or two-thirds, a long apical part remaining simple. *venustaria* does not vary and is recognizable at a glance. Japan: Oiwake.
- repulsaria*. **B. repulsaria** *Walk.* (20 i) belongs to a small subsection of the *acaciaria* group in which the ♀ antenna is bipectinate (*Carecomotis* *Warr.*). On account of the narrower wings and different neuration (1st and 2nd subcostals both well free) it cannot be united with the section *Ophthalmodes*, in which this is also the case. Size of *venustaria*, rather narrower, dark, dingy brown-grey, the median area only a little lighter, narrower, cell-marks more broadly dark-edged, postmedian line continuous but not sharp, curved outwards at radials. ♂ antennal pectinations longer and coarser. Described from Hong-kong, but Dr. SERTZ has taken it at Shanghai and WILEMAN an example on Japan. Also inhabits Formosa.
- leucophaea*. **B. leucophaea** *Btlr.* (= *elegans* *Ob.*) (20 i) has the cell-marks similar to those of *cinctaria* but is larger, with longer antennal pectinations, median area not paler than the rest of the wing, postmedian line more strongly dentate, the white spot on the forewing between this and the subterminal (indicated in some *cinctaria*) very strongly and characteristically developed. — ab. **pagina** *Wilem.* is a lighter, greyer ♀ form, the ♀♀ of *leucophaea* are generally less brown than the ♂♂. — Japan and the Ussuri district.
- nigrofasciaria*. **B. nigrofasciaria** *Leech* is regarded by PÜNGELER as distinct from the preceding. It is characterized by the strong black median line (on the forewing bent round the cell-spot), obsolescence of the characteristic white outer spot and stronger development of a longitudinal line behind this (between the 2nd and 3rd radials). Ground-colour rather more violaceous grey, sometimes much less dark-dusted. As more or less intermediate forms occur, I doubt its validity. Japan.
- repandata*. **B. repandata** *L.* (= *bistortae* *Vallot*) (20 i) and a group of nearly allied forms or species are generally characterized by the course of the postmedian line of the forewing, which bends suddenly basewards at the fold, thus forming a second conspicuous projection, in addition to the usual anterior one. *repandata* is excessively variable and some of the forms are difficult to classify. The name-type has a cinereous ground-colour and rather strong brown and fuscous markings. — ab. **destrigaria** *Haw.* has the ground-colour paler but more strongly dusted, the fuscous lines subobsolete, subterminal line distinct. — ab. **muraria** *Curt.* is rather uniform grey, almost without brown admixture, in general weakly marked. Forms a local race in many parts of N. England and Scotland, also according to STAUDINGER in the Amdo district. — ab. **nigricata** *Fuchs* (= *fumosae* *Gregson*, *nigra* *Tutt*) is almost or altogether black, sometimes with the subterminal line remaining whitish. England and Germany. — ab. **nigropallida** *Mansbridge* is a modification of *nigricata* with silvery grey patches in the middle of the wing. — ab. **ochronigra** *Mansbridge* is another modification of *nigricata*, with the subterminal shades yellow ochreous instead of whitish. — ab. **conversaria** *Hbn.* is a beautiful form (or group of forms) with the median area black; the succeeding area is sometimes clear white. —

sodorensium Weir is a small leaden grey form from the Hebrides, adapted to the gneiss rocks on which it rests. — **depravaria** Stgr. is another small grey race, probably less dark and more unicolorous than the preceding, but I cannot compare them. Distributed in Central Asia (Ferghana to Ili, Ala Tau, etc.). — **deversata** Stgr. is similar to *conversaria*, ground-colour greyish, median band narrower posteriorly, followed distally by a roundish black spot behind the 3rd radial. Kentei and Alai Mountains. — Larva twig-like but without humps, sides puckered, face flattened. Very variable, the ground-colour some shade of brown, commonly with dark spots or marblings. Polyphagous, hibernating. Pupa glossy, red-brown, in a very slight cocoon in the earth. On the wing in June and July; Europe to Transcaucasia.

B. admissaria Guen. (20 i) represents *repandata* in Afghanistan, N. India, Tibet and China and is fully as variable. It needs exhaustive study, as the antennal pectinations vary in length. Individual examples are sometimes scarcely separable from *repandata*, but as a rule the species (or race) shows the following characteristics. Wings relatively more elongate, the forewing above and especially beneath with more dark clouding in the distal area, the space between the median and postmedian lines, on the other hand, very commonly pale or even white, the median line generally well developed, postmedian line of hindwing generally more bent or angled at the 1st radial. The name-type has the median area rather light yellow-grey, the dark markings moderately well expressed. — **nudipennis** Warr. is more violet-grey, the lines well marked, the clouding in the distal area almost obsolete. Antennal pectinations long. N. W. Himalayas. — ab. (?) **iterata** Btlr. (20 i). Ground-colour about as in the type, median line very strong and thick. Distributed. — ab. (?) **trikotaria** Feld. The space between antemedian and median lines filled up into a narrow dark band, the distal half of the median area broadly whitish. Distributed. — ab. (?) **subnitida** Warr. Rather dark grey, paler in the disc, the lines weak. — **nobilis** Alph. Variegated, the median area almost entirely pale, the distal (also on the hindwing) strongly clouded with brown. W. China. — **obsoletaria** Leech (20 i). Almost unicolorous light brownish, with cell-dots and remnants of the dark markings. Tibet: Hou-kow. — **perspicuata** Moore (= vicina Moore). Much brighter ochreous brown, the median and postmedian lines acutely angulated on the fold; dark borders on under surface strong. Antennal pectinations long but rather less in number than in some of the forms. Dharmasala to Central China.

B. maculata Stgr. (21 a) has been proved by the genitalia to be a distinct species from *repandata*. Purer ash-grey than European *repandata*, with less irroration, almost always with three distinct black lines, distally to the third a black spot as in *repandata deversata* (which should possibly be removed here?). ♂ antenna with longer pectinations. Distributed in Siberia, entirely supplanting *repandata* in Amurland. — **bastelbergeri** Hirschke is the European representative of *maculata*, variable but in general larger and more strongly marked. From *repandata*, apart from the structure, it may generally be differentiated by the less bent antemedian line, strong median shade, usually approximated thereto, and more strongly marked underside. ♀ upper-side less characteristic, median shade less thick, less straight, more distally placed. Larva closely similar to that of *repandata*. Distributed from Switzerland to Bukowina, overlooked until recently. It flies at the end of July and in August, thus later than *repandata*. — Whether *maculata* is structurally distinct from *admissaria* remains to be investigated; I am inclined to doubt it.

B. picata Btlr. (21 a) resembles *admissaria* ab. *trikotaria* but with still darker distal area; equally noticeable on the hindwing (where the subterminal line shows up prominently) and on the underside. The forewing beneath has a very conspicuous light median band, not (as in *trikotaria*) encroached upon in the middle by a strong dark projection from the distal area. Apparently not variable, except that the ♀ is lighter. Japan.

B. columbinaria Leech (21 a) is similar to some of the most mottled grey forms of *admissaria*, but easily distinguished by the admixture of light blue-grey scales in the fuscous parts, giving it quite a distinctive tone. Antennal pectinations much shorter. Central China: Chang Yang.

B. extinctaria Ev. (= *exustaria* Stgr.) (21 a) again resembles the greyer, most weakly marked forms of *repandata*, but differs in the course of the postmedian line of the forewing, which is less bent, and in the underside, which lacks the distinct light apical and mid-terminal spots of *repandata*. The antennal pectinations are perhaps shorter. Grey, with all 3 lines generally indicated, but very weak, the antemedian proximally and the postmedian distally accompanied by indistinct yellow-brown bands. Distributed throughout Asiatic Russia.

B. moupinaria Leech (21 a) is a sober grey species with the postmedian line more straight than in any other of the group, almost entirely parallel with the distal margin. A tinge of yellowish is noticeable in the basal area and on the postmedian line. Forewing beneath somewhat smoky, darker distally, hindwing dirty whitish. W. China: Mou-pin, only the type known.

B. moesta Btlr. (= *cinerea* Btlr.) (21 b) is darker and more brownish grey than *moupinaria*, somewhat more mottled, without the yellowish line, the postmedian line more bent (though less so than in *repandata*), the subterminal more deeply dentate. Ground-colour whiter beneath than above, but with strong dark dusting, the basal half of the hindwing the whitest, both wings darkened distally to the postmedian line. Japan.

- subrepandata*. **B. subrepandata** *Stgr.* (21 b). Easily distinguished by its smaller size and by having the antemedian and postmedian lines of the forewing at the hindmargin more oblique and more approximated. Underside not sharply marked. Hindtibia of ♂ without the strong dilation and hair-pencil of *repandata*. Zerafshan, Ferghana and Issyk-kul.
- granitaria*. **B. granitaria** *Moore* (21 b) differs from the species of the *repandata* group in the strong dark blue-grey shading as well as in the non-dilated hindtibia. On the forewing only a patch in the middle of the distal margin and the distal part of the median area remain light brown, the latter area crossed by an ill-defined patch of blue-grey in the middle. Distributed in the N. W. Himalayas. — *sublimis* *Bitr.* has the ground-colour more whitish brown, the median area of the forewing and a great part of the hindwing almost entirely free from blue-green suffusion. Dharmasala.
- southi*. **B. southi** *nom. nov.* (= *divisaria* *Leech* nec *Walk.*) (21 b) is coloured and marked somewhat like mottled examples of *perspicuata*, but is considerably smaller, shorter-winged, the postmedian line nearly straight (especially beneath), the underside quite different, light brown-grey with uniform fine dark irroration, a cell-dot and a rather thick postmedian line, the latter darkest on the veins. W. China: Pu-tsu-fang.
- arenaria*. **B. arenaria** *Hufn.* (= *viduata* *Schiff.*, *angularia* *Thnbg.* [nom. praeocc.], *viduaria* *Bkh.*) (21 b). A pretty and distinct species, the wings rather broad, white, the forewing in addition to the very sinuous black lines with a good deal of dusting and mottling, a white spot remaining free in middle of distal area. — Larva nearly cylindrical, with slight lateral protuberances; dull red-brown or grey-brown, intermixed with paler. On lichens on oak and birch. Pupa dark red-brown, hibernating in a slight cocoon. The moth appears in May or June and according to XAMBEU flies in broad day-light at a great height, settling on the tree-trunks. Local in Central Europe.
- nigridorsaria*. **B. nigridorsaria** *Guen.* (21 b). Antennal pectinations much shorter, the lines in the type form obsolescent, dusting less strong, only the blotches proximally to the subterminal line well developed. Thorax above black. Variable. — ab. *venustularia* *Walk.* has the forewing somewhat suffused with brownish (distally with blue-grey or blackish), the lines developed. — Dharmasala, etc.
- pryeraria*. **B. pryeraria** *Leech* (21 a) is larger, bright ochreous, with very large rounded cell-spot and strong discal blackish clouds, continued on the hindwing. Japan, the type unique.
- lenticularia*. **B. lenticularia** *Leech* (21 b). Only the ♀ is known, but the species is perhaps related to *nigridorsaria*, not altogether unlike a large ab. *venustularia* of that, but sufficiently distinct in the coloration and markings. Wings rather longer, cell-spots larger, postmedian line broken into vein dashes, on hindwing further from cell-spot. W. China: Wa-ssu-kow.
- lichenaria*. **B. lichenaria** *Hufn.* (= *pictaria* *Thnbg.*) (19 k). Size and shape nearly as in *viduata*, markings somewhat similar, but the very irregular course of the postmedian line of the forewing is quite unmistakable. Moreover there is nearly always a strong moss-green admixture in the ground-colour and the white distal spot is wanting. The pectinations reach to the apex of the antenna, on which account it has been separated generically (*Cleocineraria* *rodes* *Warr.*). — ab. *cineraria* *Bkh.* is ash-grey or whitish. — Larva with dorsal humps on the abdominal segments, greenish grey with blackish markings, beautifully assimilated to the tree-lichens on which it feeds. Hibernates. Pupa slender, deep red brown, in a slight network cocoon among the lichen. Moth in June and July Central and parts of S. Europe, the Taurus and Transcaucasia.
- amoenaria*. **B. amoenaria** *Stgr.* (24 b) is said to be nearest to *maeoticaria*, but the forewing with a pale grey median area, antemedian line only obtusely dentate on the subcostal and median veins, postmedian weakly curved in S-shape, with only a very small acute angle near the costa. Ussuri district.
- maeoticaria*. **B. maeoticaria** *Alph.* (= *decoloraria* *Alph.*) (24 b). Antennal pectinations as in *lichenaria*. Wings brown-grey, sometimes with a green suffusion, median area not lighter, antemedian line right-angled outwards in the middle, postmedian very characteristic, the tooth outwards near the costa being much broader than in *amoenaria* and followed by a long, strong inward curve. S. E. Russia and Asia Minor. Forms the genus *Asovia* of ALPHERAKY.
- jubata*. **B. jubata** *Thnbg.* (= *glabraria* *Hbn.*, *teneraria* *Hbn.*, *plancaria* *Hbn.*, *dilatata* *Wrnbg.* nec *Hufn.*) (21 c) is easily distinguished from *nigridorsaria*, to which probably it most approximates, by the very large cell-spot of the forewing and the white thorax, merely black-spotted posteriorly. — ab. *nigrocincta* *Fuchs* has a black band between the antemedian and median lines of the forewing. — ab. *obscura* *Fuchs* is almost uniformly suffused with blackish grey. — The life history has been rather fully described by PROCHNOW (*Ent. Zeit.* Guben vol. 19). Egg elongate-oval, with irregular longitudinal furrows; its colour yellow-green. The larva is without humps; light green of two shades, with longitudinal rows of black spots and dashes. On tree-lichens, especially *Usnea barbata*, hibernating. Pupa slender, glossy yellow-brown. Moth in July–August, local, chiefly in pine-woods. Central Europe and again in E. Siberia and Japan.

B. leechi *Püng.* (= *nigrofasciaria* *Leech* [nom. praecox.]) (21 c) is characterized by the pale ground-colour and dark median band with very irregular proximal edge and strongly dentate distal edge. Palpus and tongue rather short, antennal pectinations long, reaching to near the apex. W. China. Closely related to *fuliginea* *Hmps.* from India. *leechi.*

B. ningpoaria (*Leech*, MS.) *sp. nov.* (21 c). ♂. Face flat, nearly smooth. Palpus short. Antennal pectinations short and slender. Forewing with 1st subcostal arising free, sometimes anastomosing with costal; brown with a yellowish line or narrow band representing the postmedian, except at costa, where there are one or two blackish spots; antemedian and median lines strong, approximated, the latter preceding (or curving outwards so as to touch) the elongate black cell-mark; some dark dusting in basal and distal areas and between the antemedian and median lines; subterminal line much interrupted, chiefly indicated as a whitish dot behind the 3rd. Hindwing very weakly marked, the yellow line faint or obsolete. Underside of forewing more weakly, of hindwing more strongly marked than above. China: Ningpo (type and cotype), April and June; Hong-Kong (1 ♂), March all 3 in coll. Brit. Mus. — **reformatz** *subsp. nov.* has the yellow shade suppressed, a complete postmedian line of fuscous dots; hindwing above with both lines developed. Chungking, June, 1 ♂ in my collection. *ningpoaria.* *reformata.*

B. semiclarata *Walk.* is a variable species, but distinguished by its ochreous hindwing and under-side, more reddish forewing above, with large cell-spot and strongly bent or angulated postmedian line. Very commonly there is a large clear spot in the middle of the distal area and many examples show strong black cloudings in the basal area and distally to the postmedian line. In the name-type the hindwing is only strigulated with fuscous in the inner-marginal part and is often in part very light, whitish ochreous. N. W. Himalayas. — **quadrifera** *Walk.* (= *subochrearia* *Leech*) (21 c) has the entire hindwing strigulated, though generally blackest at the inner margin. N. W. Himalayas and Omei-shan. *semiclarata.* *quadrifera.*

B. punctimarginaria *Leech* (21 c) is perhaps not a *Boarmia*. Face smooth and narrow, fovea very strongly developed, neurulation somewhat intermediate towards the following section, the 1st—2nd subcostal being moderately stalked. A dark and weakly-marked species, but recognizable by the small, sharp white dots which represent the subterminal line. Kiukiang. *punctimarginaria.*

B. bilinearia *Leech* (21 c). Systematic position also doubtful. Face smooth, fovea slight, 2nd subcostal of forewing long-stalked with 3rd—5th. Rather glossy, characterized by the position and shape of the black lines. W. China: Mou-pin. *bilinearia.*

D. Antenna of ♂ bipectinate. Forewing with 1st—2nd subcostal long-stalked or coincident (*Boarmia* *Tr.*).

B. atlanticaria *Stgr.* (21 c) according to a single example before me somewhat resembles a narrow-winged *solieraria* (25 c), but has stronger tongue, shorter antennal pectinations, more crenulate-margined hindwing and 1st—2nd subcostal of forewing coincident. The 2 principal lines (the latter white-edged distally) are approximated at inner margin (with dark shading between them), but diverge abruptly about at the 2nd median and the postmedian becomes crenulate or dentate: both are more or less obsolete costally; on the hindwing the postmedian bends strongly about the 1st radial. Larva smooth, elongate, on *Juniperus phoenicea* in February, producing moths April-May. Andalusia, — In *holli* *Ob.*, from Algeria, the lines are more nearly parallel, the postmedian more crenulate throughout. *atlanticaria.* *holli.*

B. tenuisaria *Stgr.* (24 b) is perhaps related to *atlanticaria*, but according to the figure and description resembles *Apleroneura epione* *Prout* (from S. Africa), though longer-winged. A rather small species, the palpus short and slender, antennal pectinations long, reaching the apex, hindtibia not dilated, fovea scarcely developed, systematic position doubtful. Light grey-brown (pale with strong brownish strigulation), the 2 lines of forewing oblique, the antemedian somewhat curved anteriorly, postmedian running towards, but not quite reaching apex, bent outwards about the 3rd radial. Hindwing with distal margin strongly waved or crenulate, postmedian line bent near costa, otherwise fairly straight. Palestine: Jordan Valley. *tenuisaria.*

B. corearia *Leech* (= *sidemiata* *Stgr.*) (21 c) is rather robust, the rather short antenna bearing in the very long pectinations which suddenly decrease and leave a moderate apical part simple; thus rather related to the subgenus *Phthonosema*. The pale median area, brown, blackish-spotted distal area, reduction of median line of forewing to a costal spot, presence of discal mark (generally elongate) on hindwing only and other characters render this an easily recognizable species. Both wings beneath with strong cell-spot and postmedian line. Amurland and Korea; ?Chang Yang (a local form or ally, too worn to describe). *corearia.*

B. phantomaria *Graes.* (= *moltrechti* *Ob.*) (19 k). Pectinations also long. Similar to *tendinosaria* but more unicolorous dark smoke-grey, the lines black, at hindmargin of forewing thick, a conspicuous white subterminal spot behind the 3rd radial. Underside smoky grey, without the postmedian line of *tendinosaria*. Amur and Ussuri district. *phantomaria.*

- eosaria*. **B. eosaria** Walk. (= *sinuosaria* Leech) (21 c) is a handsome species, perhaps related to the two preceding but very distinct in the more violet-grey ground-colour, more red-brown markings and in having the black lines more sinuous, thickened in places, especially at the hindmargin of the forewing. Chusan Islands to Ningpo.
- obscuraria*. **B. obscuraria** Leech (21 e). Very distinct in the deep red-brown colouring and rather *Hemerophila*-like markings; the distal margin of the hindwing is strongly crenulate as in that genus, but the wings are elongate and the fovea developed. In some respects it somewhat recalls *rimosa* or *phantomaria*. Antenna rather short, very strongly pectinate. W. China: Pu-tsu-fang.
- vierthii*. **B. vierthii** Bohatsch is said to come between *secundaria* and *ribeata*, but according to MEYRICK has the neurulation of the section *Boarmia*. Antennal pectinations quite different from those of *secundaria*, tapering towards their tips, median area of forewing considerably narrower, antemedian line more curved, postmedian less so, distal area more regularly darkened, without the quadrate pale spot, behind the 3rd radial vein. From *manuelaria* (25 g) it also differs in the tapering pectinations, the postmedian line of the hindwing is placed further from the distal margin, the subterminal line shows no dark shading proximally. Larva in May, on oak. Moth at the end of June and in July, only known from Hungary and Marasch (Taurus).
- approximaria*. **B. approximaria** Leech (21 d) except in neurulation resembles a large *ribeata*, but the antemedian line is straighter, the postmedian of the forewing more oblique from its angle to the hindmargin and the underside, as in the succeeding group, is weakly marked, only the cell-spots and postmedian line being present. W. China: Ni-tou and Pu-tsu-fang.
- roboraria*. **B. roboraria** Schiff. (= *consobrinaria* Hbn. nec Bkh.) (21 d). This species and its Asiatic forms or allies represent the largest *Boarmia*. It further differs from *punctinalis* in having the discal lunules blacker, not pale-centred, the lines more thickened and blackened at the hindmargin, the subterminal less deeply dentate, underside of forewing with a dark subapical mark which is wanting in *punctinalis*. — ab. *infusata* Stgr. (21 d) is much darker, the upper surface densely dark-dusted throughout. — ab. *melaina* Schulze is a more extreme melanotic development, satiny black, with the underside also infuscated. — Larva like a knotted oak-twigg, the 2nd abdominal segment much swollen and bearing a pair of dorsal protuberances, the 3rd with protuberances beneath, the 8th with a dorsal ridge; brown with lighter and darker mottlings, no very definite pattern. On oak, hibernating. Pupa stout, with strong sculpturing, dark chestnut-brown. On the wing in June and July, found resting on tree-trunks by day, often visiting „sugar“ late at night. Europe and Transcaucasia. — **B. isabellaria** Stgr., founded on 2 specimens (Urga and Kentei) is perhaps a mere aberration. Fuscous irroration wanting, lines extremely distinct. — **B. arguta** Btlr. (= *amurensis* Stgr.) (21 d) represents *roboraria* in S. E. Siberia and Japan. The ground-colour is appreciably darker, the black markings much stronger, a black spot distally to the postmedian of the forewing. Underside normal or with stronger postmedian line, sometimes with increased dark dusting and larger subapical cloud. Recorded as an aberration from the Kentei district. — **B. menetriesi** Stgr. (= *kidsicola* Gmbg.) is puzzling, perhaps a small, narrow-winged, weakly marked aberration of *roboraria arguta*, but said to have the cell-mark of the forewing pale-centred; underside almost unmarked except the discal lunules. Amurland: Kidsi, one only.
- lunifera*. **B. lunifera** Btlr. (21 d). Closely related to *roboraria*, on an average still larger, ground-colour almost as strongly dusted as in ab. *infusata* but with more brown admixture, the lines strong, deeply lunulate-dentate, their course somewhat different (very noticeable is the oblique posterior and of the postmedian of the forewing), their thickening at the hindmargin not appreciable, the underside glossy violet-grey with darker submarginal band, the forewing with white apical spot. Japan.
- invenustaria*. **B. invenustaria** Leech (21 e). Differs from *roboraria* in having the discal marks pale-centred, lines less blackened at hindmargin, the median obsolescent, postmedian much less bent, followed by a stronger brown shade (superficially recalling the subgenus *Phthonosema*), underside more dusted. — ab. *suffusaria* Warr. Uniformly suffused with dull grey, obliterating the markings. — Japan and Amurland. — **B. sinicaria** Leech has the postmedian line sharper and blacker, subterminal better defined, more bent, cell-mark of hindwing black, rarely pale-centred. W. China.
- punctinalis*. **B. punctinalis** Scop. (= *urticaria* Hufn., *griseonigra* Goeze, *bandevillaea* Gsoff., *consortaria* F.) (21 e). This species, generally known by its youngest name, is variable in colour, but generally easy to recognize. Hindwing beneath with hairy clothing between 2nd submedian vein and fold, such as becomes highly developed in the subgenus *Serrada*. The typical form is slightly more brownish than that of *roboraria*. — ab. **B. consobrinaria** Bkh. is nearly uniform grey, with dark band before the subterminal line. — ab. **B. humperti** Humpert (21 e) is unicolorous blackish, only the somewhat interrupted subterminal line white. — **B. grisearia** Bartel is very small, very uniform grey, feebly marked, the underside not black-dusted. Orenburg. — **B. marginata** Herz is also small, rather uniform grey-white, but with a dark border between the subterminal line and termen. Upper Amur and Korea.

— Larva twig-like, with 2 large dorsal protuberances on the 2nd abdominal segment, small lateral warts on the 3rd, 4th and 5th and two dorsal points on the 8th; variable, green or brown, commonly with dark marblings. On oak, birch, blackthorn, etc., full fed in August or September. Pupa short and stout, with distinct sculpturing; dark red-brown. Moth in June. Central and S. Europe, Asia Minor, Transcaucasia. — *conferenda* Btlr. is *conferenda*, possibly a distinct species, as the antennal pectinations seem somewhat coarser and less rigid, and the hair on hindwing beneath is more developed, but otherwise it differs little from the strongly brown-grey-dusted forms of *punctinalis*. A more distinct brown band commonly accompanies the postmedian line. Ussuri district, Japan, Korea, W. China.

B. displicens Btlr. (= *molata* Warr.) (21 e). Smaller than *punctinalis*, distal margin of hindwing less *displicens*. crenulate, irroration and lines thicker and blacker, discal spots smaller, blacker, not pale-centred. Japan and Ichang.

B. definita Btlr. (21 e) is related to the two preceding but unmistakable on account of the brown *definita*. proximal and distal areas, very thick black median shade approximated to the antemedian, large but not annulated cell-spot of forewing and whitish area between this and the postmedian. Fovea slight. — ab. *fuscomarginaria* Leech (= *nigrifumata* Warr.) (21 f) has the distal area (sometimes also on the underside) predominantly *fuscomarginaria*. smoke-colour. — Japan: Tokyo, Oiwake, Oyama, etc.

B. fumosaria Leech (21 f). Quite distinct in its shape, scheme of colouring and the very long antennal *fumosaria*. pectinations. Face rather flat. The colouring strongly recalls *fuscaria*, but the two could not be confused. Japan.

B. tchraparia Ob. (= *tachraparia* Leech), (21 f) described as a *Hemerophila*, appears to be probably *tchraparia*. a *Boarmia* and may be provisionally introduced here. The build is said to be rather slender, the antenna rather long. Both wings red-brown, the median area of the forewing (distally limited by a weakly S-shaped line) and the corresponding part of the hindwing more mixed with blackish. Cell-spot most conspicuous on hindwing. Underside paler. Ta-chien-lu.

B. sordida Btlr. (as *Selidosema*) (21 f) is similar in structure to *fumosaria* (21 f), but much smaller and *sordida*. lighter-coloured, the forewing with apex and distal margin rather more rounded. Its nearest relatives are Indian, but it may readily be distinguished by the reddish-brown clouds proximally to the subterminal line. Japan.

B. catotaeniaria Pouj. (21 f) agrees in structure and coloration with *sordida* but is erratic in shape, the *catotaeniaria*. more strongly projecting middle part of the distal margin of the hindwing, and sometimes of the forewing being quite exceptional in *Boarmia*. — ab. *restrictaria* Leech has the dark median area of the hindwing restricted to *restrictaria*. the narrow median shade itself, the blotch at hind-angle of forewing also restricted and removed somewhat from the distal margin. — Central and W. China.

B. seitzii sp. nov. (24 b). ♂, 26 mm. Palpus and tongue short. Antenna with long pectinations. Hind- *seitzii*. tibia dilated. Forewing with 1st—2nd subcostal coincident, arising from stalk of 3rd—5th near its base. Light yellowish brown. Forewing with costal margin fuscous to nearly one-fourth and spotted with fuscous beyond; antemedian line nearly obsolete; postmedian expressed by a V-shaped costal mark and a series of vein-dots, parallel with distal margin; an interrupted submarginal series. Hindwing with discal spot very large, proximally to it a broad band of fuscous dusting accompanying the median line. Forewing beneath more strongly dark irrorated, especially in proximal half, forming a diffuse band just proximally to the cell-spot, postmedian line and subterminal band almost continuous; hindwing beneath more nearly as above. Collected by L. KLA-PHECK, in Shantung, type in coll. SEITZ. Related to *catotaeniaria* but smaller, shorter-winged, etc.; all the fuscous markings have a slight chocolate tinge.

B. jejunaria Leech (= *leptoptera* Alph.) (21 f) is a rather isolated species. Build rather slender, wings *jejunaria*. ample, delicate, light violet-grey with a more yellowish tinge at base and distally to the postmedian line; the latter broken into dots in its posterior part. W. China: Ni-tou, etc.

B. olivacearia Leech (21 f) and the following species are excentric in having all the subcostal veins *olivacearia*. stalked, the 1st—2nd, however, as in many of this group, coincident throughout. Face rounded, without tuft, palpus rather short, antennal pectinations long. An obscurely marked insect, a grey slight, very glossy suffusion overspreading a great part of the wings; costal area of forewing freer from the suffusion, thus more brownish, distally to the fine, dentate postmedian line brighter reddish brown. W. China: Wa-shan.

B. insolitaria Leech (21 f). Only the ♀ known, probably near *olivacearia* though superficially very *insolitaria*. distinct in its reddish brown colour and very pale grey patches, occupying most of the costal region of the forewing and the distal part of the hindwing. Central China: Chang Yang.

ornataria. **B. ornataria** *Leech* (21 h). Build more robust than ordinary, palpus and tongue quite short. Easily known by the extraordinary mottling of light ochreous, ferruginous, olivaceous and fuscous, with ill-defined light ochreous line distally to the postmedian, followed again by interrupted ferruginous band and vague dentate subterminal. — ab. *inornataria* *Leech* is a duller form, with the ochreous admixture and line almost wanting. — Japan, Shanghai and Chekiang. Also in Assam. Perhaps a form of *retrahens* *Moore*, the type of the (perhaps justifiable) genus *Calicha* *Moore*.

E. Antenna of both sexes bipectinate. Forewing with 1st subcostal usually arising from costal (*Ophthalmodes* *Guen.*).

irrorataria. **B. irrorataria** *Brem. and Grey* (= *senex* *Btlr.*) (23 a). This and the other *Ophthalmodes* species are characterized by the large ocellated discal spots both above and beneath and are generally more or less green. *irrorataria* is less large than most of the group, the cell-spots not very broadly dark-bordered, the hindwing with more or less strong fuscous irroration between median and postmedian lines. The name-type is very pale green, easily fading to dirty whitish. N. E. China, Japan and Korea. — *hedemanni* *Chr.* is of a fuller and deeper green, the underside sometimes darker and with a rather dark submarginal band. Amur and Ussuri district and W. China. Also as an aberration in Japan.

sinensium. **B. sinensium** *Ob.* Brighter green than *hedemanni*, the markings less blackish brown, postmedian line less deeply dentate, median line of hindwing crossing the cell-spot, the fuscous irroration wanting. W. China: Tien-tsuen.

albosignaria. **B. albosignaria** *Brem. and Grey* (= *saturniaria* *Graes.*, *ocellata* *Leech*) (21 g). White without a tinge of green, the postmedian fuscous line broken into dots or obsolete, but its position indicated by some ill-defined light brown shading; discal spots large, broadly dark ringed; underside with black marginal bands; interrupted in the middle. — ab. *juglandaria* *Ob.* has much stronger dark markings (large brown spots) on the upperside. — Ussuri, Japan and China.

F. Build robust. Antenna of ♂ dentate-fasciculate. Forewing with 1st—2nd subcostal separate (*Ascotis*).

selenaria. **B. selenaria** *Schiff.* (21 g). A variable species, but recognizable at once by the long forewing, the ocellated cell-spots and the antennal structure. The name-type is white with only slight brown irroration except as a narrow band-like accompaniment to the lines. Distributed from Central France to S. Russia, Transcaucasia and the Altai. — In warmer latitudes (S. Europe to Palestine, Szechuan, Korea, Shanghai, etc.) a much more brown-grey form occurs, *dianaria* *Hbn.* Specimens from India and S. China differ little from some of these. — *artemis* *Stgr.* is a small white race, almost without brown irroration and bands. Amur and Ussuri district. — ab. *sordida* *Warr.* is another small form, but is dirty yellowish-white or yellowish-grey, the lines of the forewing obsolete. I have seen it from Korea and Chekiang. — *cretacea* *Btlr.* (21 g) is another modification of *dianaria*, very large, the lines and bands very sharply expressed, underside also sharply marked. Japan. — Egg elongate, light grey or yellow-green. Larva without humps, yellow-grey or reddish, dorsal line broken up into very variable black-brown spots. On various low plants, in Europe hibernates as pupa. Moth in 2 generations, very widely distributed, reaching the Congo, the Cape and Ceylon.

G. Build robust. Antenna of ♂ dentate-fasciculate. Forewing with 1st—2nd subcostal long-stalked (*Cusiala* *Moore*).

stipitaria. **B. stipitaria** *Ob.* (= *doerriesiaria* *Chr.*) (21 g). White with zigzag black lines, accompanied by ill-defined brown bands, the cell-mark not ocellated. The hindwing has a rather characteristic shape, being much more strongly and irregularly convex than in *selenaria*, markedly crenulate. Only a slight modification of the Indian *boarmioides* *Moore*. — ab. *piperitaria* *Ob.* (19 k) has the markings much more blurred, duller, the black lines almost or altogether obsolete. — Ussuri district, Japan and Korea.

H. Build not robust. Antennal ciliation much shorter, usually in paired fascicles, rarely simple (*Ectropis* *Hbn.*).

crepuscularia. **B. crepuscularia** (? *Schiff.*) *Hbn.* (= *biundularia* *Esp.* part., nec *Bkh.*, ? *alba* *Gauckler*, *bistortata* *Rbl.* nec *Goeze*) (21 g). Confusingly similar to *bistortata*, but biologically distinct. Distal margin of forewing on an average slightly less oblique, ground-colour white with slight yellowish suffusions (never ochreous, ferruginous or umber-brown), the bands which normally accompany the lines in *bistortata* at most only feebly and vaguely indicated, the black postmedian line itself standing out conspicuously. The ♀ is still whiter than the ♂, generally unmistakable. — ab. *delamerensis* *B.* *White* is so densely powdered with blackish fuscous that this appears as the ground-colour, only fine white irroration generally remaining. Common in N. England. — ab. *nigra* *Th.-Mieg* has no white remaining except a slight subterminal line. Chiefly from S. Wales. — *pallidaria* *Krulik.*, from E. Russia, may be synonymous with the type. It is described in Russian and the Latin diagnosis merely reads: „var. multo pallidior“. — Egg smaller than that of *bistortata*; other assumed differences (less

elongate form and more yellowish colour) have proved inconstant. — Larva very variable and showing no absolutely constant difference from that of *bistortata*; oftener dark or dull in colour, the V-shaped dorsal markings perhaps less often completely developed. On various deciduous trees, June to August. The moth is single brooded, appearing in May and June, thus intermediate between the two broods of *bistortata*, only in very warm seasons sometimes already in April. It is generally common in England and Ireland and is known to me from Germany and Switzerland, probably overlooked in some localities but certainly much less distributed than *bistortata*. — hybr. gen. aest. **bacoti** Tutt (*crepuscularia* ♂ × *bistortata* ♀). Greyish, the lines tending to be weak, some fuscous subterminal suffusion. — **lutamentaria** Graes. is a form from the Amur and Ussuri districts and probably N. Japan, which still needs biological investigation. It is small and yellowish in tone, the bands and a median shade yellower. STAUDINGER considered it very near English *crepuscularia* but as it occurs from the end of June to the beginning of August it might rather be a second-brood form of *bistortata* or even (as STAUDINGER suggested) of *excellens*, but GRAESER says that the ♂ antennal ciliation is longer than in the former, the face broader and the eye more prominent. ♀ ovipositor long. From *crepuscularia* it differs in its somewhat smaller size and less sharp black lines. Neuration the same. bacoti.
lutamenta-
ria.

B. bistortata Goeze (= *biundularia* Bkh., *crepuscularia* Dup.) (21 g). This species, the *crepuscularia* *bistortata* of most continental authors but not of HÜBNER, is far more variable than true *crepuscularia*, but in the rare cases in which it is almost equally white it appears always to develop conspicuous brown or ochreous bands proximally to the antemedian line and distally to the postmedian. Nearly always, however, the ground-colour itself is more mixed with brown. — ab. **fasciata** (Reuter, ubi?) Petersen is said to be very light, the postmedian line of both wings broadened into a black band. — ab. **striata** Aigner is rather dark-mottled, with the marginal dots extended into longitudinal dashes. — ab. **defessaria** Fr. (= *passetii* Th.-Mieg, *schillei* Klem., *tristis* Riesen) is dark fuscous throughout, with a white subterminal line. Only distinguishable from certain *crepuscularia* ab. *delamerensis* and *nigra* by its somewhat more brownish tinge. — gen. aest. **baeticaria** Scharfenb. (= *striularia* Steph.) is smaller and paler than the spring form, sometimes as pale as *crepuscularia* but then of a dead greyish white (not yellowish) and weakly marked. — **laricaria** Haw. is a local race in the South of England, of a much brighter ochreous tone, sometimes very large. Confined to the spring brood, its progeny in July producing *baeticaria*. — Egg smooth, though without gloss, only at the micropylar end reticulated; variable in shape; yellow-green; protected by a covering of wool from the end of the abdomen of the parent. — Larva stout (perhaps slightly more so than *crepuscularia* larva), head and prothorax relatively small, mesothorax much swollen, 8th abdominal with a horseshoe-shaped prominence; face with a dark V-shaped mark; body variable, generally yellowish brown with darker mottlings, usually a distinct V-shaped dark dorsal mark on 2nd abdominal, sometimes also on 3rd and 4th abdominal. Polyphagous on deciduous trees or even on yew, etc. Many larva feed up rapidly in May and June and produce a second brood in July or August, others feed much more slowly and the pupae hibernate. Pupa stout and compact, dull red-brown. The moth appears in March and April. Widely distributed in Europe, Asia, Transcaucasia, perhaps also in Eastern Asia. — hybr. gen. aest. **ridingi** Tutt (*bistortata* ♂ × *crepuscularia* ♀) resembles weakly-marked f. *baeticaria*, but generally with fuscous subterminal suffusion. fasciata.
striata.
defessaria.
baeticaria.
laricaria.

B. grisescens Warr. seems to me to be probably an eastern race of *bistortata*, certainly exceedingly close. It was founded on ♀♀ only (Ningpo) and said to differ from *excellens* in its smaller size (46–52 mm.), the entire absence of the dark blotch at (distally to) the middle of the postmedian line, as well as in the line itself being much less sinuate and dentate. A ♂ from Ningpo, taken in April, agrees with this description and is coloured about as in the most reddish grey (or fleshy tinged) examples of *excellens*, neuration, etc. as in *bistortata*. — A small race which is frequent in Japan (Hakodate, Oiwake, etc., June–July), measuring only 26–38 mm, also evidently belongs here; it is variable in colour, but generally has the peculiar reddish-grey tone (some ♀♀ paler with rather strong bands, as in certain ♀ *bistortata*) and except in this and its straighter lines and less suffused and irrorated underside (commonly showing a postmedian line and sometimes cell-dots) it seems indistinguishable from *bistortata*. The markings distally to the postmedian line are variable. On account of the rather straight lines and the locality I take this race to be **obliqua** Warr., described from Hakodate. grisescens.
obliqua.

B. dentilineata Moore may be a small, suffused, rather weakly marked race of *bistortata*, but the stalk of the 1st–2nd subcostal of the forewing commonly arises from the cell (in *bistortata* almost always from the stalk of the 3rd–5th). Forewing perhaps slightly narrower. Dirty white or very pale yellow-brown, with rather strong brown irroration, the lines (especially of forewing) very weak or obsolete, on the other hand the dark dashes on the veins, especially on and distally to the postmedian line, strongly developed. The dark spots in the distal area much less conspicuous than in *excellens*. ♀ ovipositor long. Larva scarcely distinguishable from the ferruginous-and ochreous-varied forms of *bistortata*: the V-shaped mark on the face scarcely darkened, the ventral area little variegated. Bred by HOCKING at Dharmasala from geranium, emerging at the end of

pulverosa. March. Distributed in N. India, a similar form at Chungking, Huang-mu-shang and Ta-chien-lu. — **pulverosa** Warr. is rather narrower winged, dull grey, powdered all over with olive fuscous. Stalk of 1st—2nd subcostal well separated from that of 3rd—5th. Kulu, common.

excellens. **B. excellens** Btlr. (= *incertaria* Stgr.) (21 h). In general larger than the 3 preceding, especially the ♀, which has a very stout abdomen but not (or scarcely) extended ovipositor. Postmedian line more dentate and sinuous but never very sharply expressed, the dark marks on and distally to it behind the 3rd radial strongly developed. The ground-colour varies from dirty white (in the ♀) to dirty light grey or dull pale fleshy brownish. Japan and Ussuri, about the end of May.

concinната. **B. concinnata** Wileman is very distinct in the irregularly crenulate distal margin of the hindwing and the strongly excurved antemedian line of the forewing; postmedian line remote from distal margin, with black teeth on the veins in its anterior part, slightly incurved behind the 3rd radial of the forewing. The name-
interrupta. type is whitish, only slightly mixed with brown. Hakodate, in April. — ab. (?) **interrupta** Wileman (21 h) is rather smaller, much more brown, only a part of the median area of forewing and the basal and costal parts of hindwing remaining paler. Tokio, in April; only one known.

consonaria. **B. consonaria** Hbn. (= *tetragonaria* Curt.) (21 h) differs from the *crepuscularia* group in its tone of colour as well as in the shape and position of the postmedian line. The ♀ is much more whitish than the ♂ and shows a stronger, darker quadrate spot between the postmedian and subterminal lines of the forewing.
nigra. — ab. **nigra** Bankes is unicolorous blackish except a very small patch of white distally to the cell. Kent. — Egg longitudinally ribbed, yellow, marked with orange red. — Larva elongate, transversely wrinkled, with 2 minute warts on the 8th abdominal; yellowish brown clouded with grey and with reddish. On birch, beech, oak, etc. The pupa hibernates and the moth appears in May. Central Europe, S. E. Siberia and Japan.

farracearia. **B. farracearia** Leech (21 h) is quite unlike all the other *Ectropis* species, the coloration resembling that of *granitalis sublimis*, though the broad wings more recall *Gnophos*. W. China. — **fuliginaria** Leech has the suffusions darker, less blue (more smoke-colour), somewhat more extended. Central China: Ichang. Only one example known.

tristis. **B. tristis** Btlr. (25 g) is also very distinct, not only in its blackish smoky wings, with white admixture in parts, especially on the hindwing, but also in the absence of the fovea (genus *Abaciscus* Btlr.). Dharmasala, etc.

praeclarata. **B. praeclarata** Püng. Rather smaller and narrower-winged than *extersaria*, antenna more slender, hindtibia of ♂ with strong yellow hair-pencil. Wings white, forewing with brown basal patch, costal spot opposite the cell-spot, larger subapical costal spot, weak, nearly straight median line (shade) and some shading to the subterminal line. Hindwing with discal dot, otherwise weakly marked. Koko-Nor.

extersaria. **B. extersaria** Hbn. (= *luridata* Bkh. nec Hufn.) (21 h). Whitish brown, very densely dotted and strigulated with dark brown, cell-spot rather large, median shade of forewing usually strong, a very characteristic (though in size variable) white spot (expansion of the subterminal line) in middle of distal area. Distributed
inalbata. in Central Europe. — ab. **inalbata** Ob. has the black lines rather approximated, the white dusting and white
cornelsenii. subterminal obsolescent. — ab. **cornelsenii** P. Hoffmann is glossy black with white band distally to the postmedian and incomplete white subterminal. — In S. E. Siberia and Japan *extersaria* is represented by a somewhat
obscurior. smaller, darker race, **obscurior** Stgr., in which the white distal spot is generally very small. — Larva elongate, with slight dark-coloured dorsal prominences on the 2nd and 5th abdominals; brown, often tinged with green. dorsum with pale quadrate spots, sides with very dark blotches. On oak, birch and other trees. The pupa hibernates and the moth flies in May—June.

costipunctaria. **B. costipunctaria** Leech (21 h). Ground-colour quite different, pale violet-grey, less uniformly dotted and strigulated, usually with a blackish spot at hindmargin of forewing uniting the median and postmedian lines, the pale distal spot ill-defined and inconspicuous but reaching the distal margin. Japan: Oiwake.

opertaria. **B. opertaria** Leech (21 h). Slightly larger than *costipunctaria*, much more mixed with brown, leaving only traces of the violet-grey colour in the median area: the dark markings much less developed. Perhaps not really distinct. Japan.

petrosa. **B. petrosa** Btlr. (21 i) is a larger and broader-winged species, hindwing with more strongly crenulate distal margin than in any preceding *Ectropis*. Bright ochreous brown, dusted and clouded with more reddish brown, all the usual lines present, though not very sharp, the postmedian dentate, nearly parallel with distal margin. Japan.

tristaria. **B. tristaria** Leech (21 i). Wings slightly narrower, the hindwing not appreciably crenulate. Dull dark brown-grey, the lines still less prominent than in *petrosa*. Kiukiang, Central China.

B. conjunctaria *Leech* (21 i) has the markings shaped more as in *rhomboidaria*, to which, indeed, it *conjunctaria* bears considerable superficial resemblance on the upper surface, though it is rather more mottled and the wings narrower. Underside paler, greyer, very feebly marked. Ta-chien-lu.

B. dilectaria *Leech* (21 i). Larger and much more brightly coloured, cell-spots sharply black, median *dilectaria* line wanting, the others widely separated, the postmedian with a characteristic shape. Abdomen of ♂ hairy beneath, approaching the section *Paradarisa*. Ta-chien-lu.

B. recurvaria *Leech* (21 i). Smaller and less variegated than *dilectaria*, median line developed, curved, *recurvaria* antmedian more bent and more oblique, hindwing lighter. Pu-tsu-fang. Also at Darjiling. Perhaps a colour form of the far darker *conspurcata* *Walk.*, which also occurs at Darjiling.

B. tripartaria *Leech* (21 i). A species standing quite apart. Coloration of forewing a little like that of *tripartaria*. *grisea* *Btlr.*, quite different in structure and shape, the thicker, differently formed black lines and uniform hindwing. Face smooth, palpus short. W. China: Pu-tsu-fang.

B. cilicornaria *Püng.* strongly suggests a small, weakly marked *arenaria*. Forewing white, with a *cilicornaria* tinge of yellowish and with brown-black strigulation and markings; an irregular spot near the base, curved rows of spots representing the antemedian and postmedian lines, discal spot and a spot on costa representing the median, subterminal line dentate, nearly straight, chiefly indicated by a dark band which accompanies it proximally. Hindwing whitish, weakly marked except at inner margin. Japan: Nikko.

B. sinearia *Guen.* (= *brunnearia* *Leech*) (21 i). Light brown, coloured and marked like *appositaria* *sinearia*. *Leech* but with different antenna (rather shortly ciliated), the lines finer, postmedian of hindwing less curved. Central China to Shanghai. Rare on Japan. — **noctivolans** *Btlr.* (= *glareosaria* *Graes.*) (25 d) differs in having *noctivolans* the median area whitish, the median line oftener obsolete, the rest of the wing in general with coarser dark dusting. Japan and the Ussuri district. I have similar, though less extreme, examples from Shanghai.

B. punctulata *Schiff.* (= *scopularia* *Thnbg.* nec *L.*) (21 i). Whitish grey with fine dark irroration, the *punctulata* lines (including the subterminal) starting from thickened, generally equidistant costal spots. Median line sometimes obsolete in middle of wing, sometimes on the other hand thickened; subterminal line irregular, its proximal dark shading interrupted. — ab. **obscuraria** *Paux* is blackish grey with the markings obsolete. — ab. **albescens** *ab. nov.* is whitish, almost entirely without dark dusting. — Larva without humps, of moderate thickness, green with yellow lines and incisions, or greenish grey or purplish. On birch or sometimes alder in July, the pupa hibernating and the moth appearing in May and June. Distributed in Europe. — **ignobilis** *Btlr.* is not *ignobilis*. quite so broad-winged, on an average smaller, darker or more darkly marked, postmedian line with an outward curve at the median veins and followed distally, on both wings, by a more or less distinct dark shade. Japan. Probably the E. Siberian forms recorded by *STAUDINGER* also belong here.

I. Build not robust. Antenna of ♂ with very long, very slender ciliation (*Myrioblephara* *Warr.*).

B. duplexa *Moore* is a North Indian species, with the forewing olive-green (fading to yellowish), *duplexa* generally not very heavily dark-dusted, the hindwing generally whitish, except towards inner margin, with a distinct cell-dot and with the postmedian line parallel with the distal margin. Otherwise quite similar to *nigrilinearia*. Recorded by *LEECH* from Pu-tsu-fang and Omei-shan. — **nigrilinearia** *Leech* (22 i), notwithstanding the darker dusting and the different position of the postmedian line of the hindwing, seems to me to be merely a form of *duplexa*. The anterior bend in the postmedian line of the forewing is perhaps less acute. W. China: Kia-ting-fu.

B. decoraria *Leech* (22 i). Only the ♀ is known, but it gives quite the impression of a *Myrioblephara* *decoraria*. Very distinct in the broad, almost clear white median area and the brown admixture in the basal area of forewing and distal area of both wings. Underside much more weakly marked. W. China: Mou-pin.

K. Antenna of ♂ with moderate or long ciliation, abdomen with a pair of strong lateral tufts of hair (*Dipturodes* *Warr.*).

B. parvularia *Leech* (23 b). Brown with a slight reddish tinge and with very strong blackish irroration, often condensed into dark clouding in posterior part of median area and in the neighbourhood of the median vein of the forewing distally. Characteristic is the postmedian line of the hindwing, which is very near the cell-dot and very acutely angulated. Gifu. Probably a form of *semiparata* *Walk.*

L. Antenna of ♂ densely ciliated, abdomen clothed with long hair below (*Gasterocome* *Warr.*).

B. sinicaria *Leech* (= *orta* *Bastelb.*) (22 k). Build rather robust, wings glossy, easily known by the *sinicaria* broadly dark-edged discal mark of the forewing and the broad dark distal margins, that of the forewing sending out a strong proximal projection to meet the cell-mark. W. China: Omeishan. Also on Formosa. Probably a broad-winged, dark-marked form of the Indian *pannosaria* *Moore*.

conspicuaria. **B. conspicuaria** *Leech* (as *Phyllabraxas*) (22 k). Much less smoothly scaled than *sinicaria*, belonging to quite a different group. Closely similar to *euryzona* *Hmps.* but with the postmedian band straighter and with a conspicuous white cell-spot. W. China: Pu-tsu-fang.

126. Genus: **Hirasa** *Moore*.

Like *Boarmia* or *Hemerophila*, but the forewing with the 1st and 2nd subcostals arising separately and anastomosing. No fovea. Range: India to Japan. Only a few species known. In the type species (*scripturaria* *Walk.*) the ♂ antenna is simple; *paupera* and probably the other two Palearctic species belong to the section *Hirasodes* *Warr.*, in which it is bipectinate.

paupera. **H. paupera** *Btlr.* (22 h) is closely similar to *scripturaria* but larger, the median shade better expressed, some stronger dark clouding in proximal and distal areas, subterminal line in part better expressed, more deeply dentate. Japan.

austeraria. **H. austeraria** *Leech* (23 b). More densely dark-dusted, postmedian line of forewing further from ante-median, less angulated on 1st radial. Pu-tsu-fang, 1 ♀.

latimarginaria. **H. latimarginaria** *Leech* (23 b). Less dusted than either of the preceding, first line obsolescent, post-median of forewing obsolescent anteriorly, that of hindwing straighter, placed nearer the discal dot. Some slight dark shading in proximal and distal areas. Ichang, 1 ♀.

127. Genus: **Sysstema** *Warr.*

Face smooth and flat. Palpus rather short, with moderately appressed scales. Antenna in ♂ with long pectinations, apex simple. Forewing with costal margin curved, 1st—2nd subcostal coincident, arising from stalk of 3rd—5th; fovea wanting. Hindwing with distal margin scarcely sinuous except between radials.

Erected for a few Indian species which differ sufficiently from *Boarmia* in the ensemble of characters—more slender build, smooth face, neurulation, etc.

projectaria. **S. projectaria** *Leech* (23 b). Easily known by the broad median area, with strong distal projection in the middle. The white band which usually follows is sometimes almost obliterated by dark dusting and on such specimens the hindwing is also more densely irrorated. W. China.

128. Genus: **Micrabraxas** *Btlr.*

Differs from *Boarmia* in the simple ♂ antenna, generally broad, glossy, rather delicate wings, with less oblique distal margin, and in having the 2nd subcostal vein of the forewing stalked with the 3rd—5th. Face rather smooth. Hindtibia of ♂ thickened, with the 2 pairs of spurs rather approximated. HAMPSON treats this as a subgenus of *Boarmia* but I doubt the relationship; it seems to me much nearer to *Psyra*, perhaps not separable therefrom (face rather smoother, palpus rather shorter, forewing not falcate). Range: N. India to W. China.

punctigera. **M. punctigera** *Btlr.* Forewing olivaceous with fuscous dusting and some faint brownish clouds, especially in the middle of the area distally to the median line; lines represented chiefly by long black dots on the veins, median line rather more connected, curved, placed well beyond middle of wing; cell-mark broken into a group of dots; subterminal line with pairs of small fuscous spots distally, the pair between the radials largest. Hindwing whitish with grey irroration and olivaceous fringe. Dharmasala and Sikkim. — **nigropunctaria** (*Leech*, M. S.) *form. nov.* (23 b) is rather larger, with all the spots relatively larger, accompanied by whitish edging, median shade weaker. Pu-tsu-fang, 1 ♀, in coll. Brit. Mus.

pongaria. **M. pongaria** *Ob.* (22 h) is less glossy and much paler, more mixed with white, the markings reduced, the cell-spot simple. W. China: Ta-chien-lu and Moupin.

nigromacularia. **M. nigromacularia** *Leech* (22 k). Smaller and narrower-winged, the pattern recalling an *Abraxas* or a *Loxaspilates*, the structure agreeing with the present genus. Pu-tsu-fang.

129. Genus: **Elphos** *Guen.*

Differs from *Boarmia* in having the palpus upturned and fringed with long hair in front, the wings very broad. Antenna of ♂ bipectinate, fovea developed. An Indo-Australian genus, only one species known from Japan. The species mostly attain a great size.

E. insueta Btlr. (22 k). Very similar to some of the Indian species but generally distinguishable by the *insueta*. larger admixture of white, especially as a sort of band following the postmedian line. Not quite so large as *pardicelata* Walk. (especially the ♀) and with quite different underside — the white ground much more spotted and mottled with smoke-colour and with larger dark blotches at the distal margins. Japan. A single ♀ from Omei-shan perhaps represents a local race, less distinctly banded, etc.

130. Genus: **Xandrames** Moore.

Differs from *Elphos* in the shorter palpus, scarcely crenulate distal margins, etc. Forewing with 2nd subcostal stalked with 3rd—5th (in *Elphos* often from the cell). Range: Himalayas to Japan and Formosa,

A. Antenna in ♀ bipectinate (*Xandrames*).

X. dholaria Moore is an Indian species which has wrongly been confused by HAMPSON with *latiferaria* Walk. It differs in the white apical patch of the hindwing (sometimes extending as a band along the distal margin about to the 3rd radial) and in other points. It occurs in the N. W. Himalayas, at Dharmasala and other Palearctic localities. — **sericea** Btlr. (24 a) represents *dholaria* in Palearctic China and Japan. It *sericea*. is rather darker, with rather broad white band, but similar examples occur in India as aberrations.

X. latiferaria Walk. has in place of the white apex or border of *dholaria* a characteristic submarginal *latiferaria*. white line on the hindwing. This arises from the costal margin near the apex, closely approaches the distal margin at the radial fold, is here bent and runs rather straight to the anal angle. Distributed in Japan and China.

X. xanthomelanaria Pouj. is recognizable at once by the convex proximal edge of the broad light sub-apical band and by the yellow coloration of this band and of the narrow border of the hindwing. W. China. *xanthomelanaria*.

B. Antenna in ♀ simple (*Duliophyle* Warr.).

X. agitata Btlr. (23 a). The ♂ is easily identifiable from our figure; sometimes the small clear sub-costal patch distally to the cell-mark is whitish. In the ♀ this patch is quite white, sometimes broadened, and the patch distally to the subterminal line is also mostly white from the 2nd radial to near the anal angle, forming with the anterior patch an oblique, interrupted band. — **angustaria** Leech is darker, especially the hind-wing, in which the light subterminal is not traceable at all. Omei-shan, only one example (♂). Except that the postmedian line of the hindwing is straighter I can see no difference that might indicate a species. *agitata*. *angustaria*.

X. majuscularia Leech (= *diluta* Warr.) (23 a). Larger and lighter, most of the fuscous clouding being suppressed; ♀ without white patches; underside much lighter. Possibly, as WARREN surmised, a mere aberration, but the postmedian line on both wings different. Japan. *majuscularia*.

131. Genus: **Tephronia** Hbn.

Face smooth and flat. Palpus minute, slender. Tongue rudimentary, perhaps sometimes wanting. Antenna in ♂ bipectinate. Hindtibia with terminal spurs only (in *tingalaria* spurless). Wings elongate, with long cells. Forewing in both sexes with large, long fovea, 1st and 2nd subcostals coincident, 3rd and 4th separating very near the apex, sometimes coincident. Hindwing with costal closely approaching subcostal beyond middle of cell, 2nd subcostal stalked with 1st radial, 2nd radial present, though very weak. — Larva stumpy, tapering at both ends; head small, flattened in front, rounded above; tubercles prominent. On lichens. — Geographical distribution restricted, exclusively Palearctic.

This remarkable genus and the two which follow are probably misplaced by STAUDINGER, but their true position is uncertain.

T. sepiaria Hufn. (= *cineraria* Schiff.) (22 a). Forewing brownish ashy, antemedian and postmedian *sepiaria*. lines black, widely separated, the latter with strong proximal curve between the 2nd radial and 2nd submedian veins, sometimes broken into vein-dashes; median shade usually indistinct except at costal margin, curved similarly to the postmedian. Hindwing paler, with fine, sinuous postmedian line. — ab. **carieraria** H.-Sch. *carieraria*. is much darker, the forewing grey-blackish, the lines whitish-edged on the reverse sides. — ab. **nigra** Rbl. is *nigra*. quite unicolorous blackish. — **chapmani** form. nov. is rather narrower winged and rather lighter than the name-*chapmani*. type, forewing with the black lines more sharply expressed, the antemedian more deeply curved basewards behind the cell, discal dots oftener present, hindwing nearly white, its postmedian line nearly parallel with distal margin, sometimes broken into vein-dots. Spain: Navalperal (province of Avila, at western extremity of Sierra de Guadarrama), 5th August, 7 ♂♂ (presented to me by T. A. CHAPMAN). — Larva brown-grey, with greenish white dorsal line and row of subdorsal spots. Full fed about June. Imago in July—August. Central and S. Europe, the Canary Islands, N. Africa, Palestine and Asia Minor.

fingalaria. **T. fingalaria** Mill. (25 c) is unknown to me but must be regarded as a separate species, the hind-tibia being without spurs. Darker than *sepiaria*, though not as dark as ab. *carieraria*, slightly larger, forewing with apex more acute, median line approximating to antemedian posteriorly, postmedian line rather nearer the distal margin than in *sepiaria*. Maritime Alps, in July.

cebennaria. **T. cebennaria** Chrét. is whitish, more or less tinged with smoky brown, silky and shining rather than irrorated. Antemedian line generally indicated by 4 dots placed in a zigzag; median shade represented by a black costal mark; postmedian nearly straight, broken into dots, followed by a more or less broad, well defined blackish subterminal band. Differs from *sepiaria* and *fingalaria* in the dotted lines, from *cremiaria* in having a dark terminal line, interrupted at the veins; from all 3 by the subterminal band. Ardèche. Structure not indicated.

cremiaria. **T. cremiaria** Frr. (= *corticaria* [?Hbn.] Dup. nec Schiff.) (22 a). Ground-colour more whitish than in *sepiaria*, with strong dusting, the veins in part darkened; antemedian line in general more excurved anteriorly, then more oblique, but variable; median shade generally well developed, often continued distinctly on hindwing; postmedian line less strongly sinuous, on both wings broken into dots or teeth; terminal line generally wanting. Palpus and tongue appear slightly better developed. Larva very similar to that of *sepiaria*, with yellowish tubercles. S. Tyrol, France and Castile. The British Museum has light examples from MANN, labelled „Hanover“.

132. Genus: **Mannia** gen. nov.

Nearly related to *Tephronia*, the hindtibia with all spurs developed, costal vein of hindwing in the type species anastomosing with subcostal to near the end of the cell, cell sometimes less long, with stronger fold, 2nd subcostal generally shorter-stalked (in *oxygonaria* separate), 2nd radial apparently less developed. Type of the genus: *oppositaria* Mann. Exclusively Palearctic.

oppositaria. **M. oppositaria** Mann (22 a). Superficially very similar to *sepiaria*, not quite so narrow-winged, antennal pectinations not (as in *sepiaria*) fusiform, antemedian line of forewing angled outwards on median vein, postmedian of hindwing angled near costa, then running straighter across the wing or even subconcave. July—

obscuraria. August; Dalmatia, Asia Minor, N. E. Caucasus. — **obscuraria** Stgr., from Astrabad (N. Persia) is much darker.

syriaca. — **syriaca** form. nov. is rather smaller, paler (whitish ashy), the lines slender, well expressed, the postmedian of the forewing followed in the ♀ by a more or less conspicuous smoky band. Syria, probably Beyrout, collected by DELAGRANGE, 4 examples in my collection.

codetaria. **M. codetaria** Ob. (24 c). Rather lighter grey than *oppositaria*, the lines rather sharply expressed, a median line and one distally to the postmedian being indicated in addition to the two principal. Probably the costal vein of the hindwing is only closely appressed to the subcostal, not anastomosed, as MEYRICK, who knew *codetaria*, does not mention the peculiarity and I have a crippled ♂ from Spain (Tragacete) which provisionally refer here and in which the veins in question do not anastomose. If the lat-named determination is correct, *codetaria* has longer pectinations and occurs also in a darker race on Teneriffe, March—April. Described from Sebdou, Algeria, taken in August. STAUDINGER adds Chiclana (Andalusia).

lepraria. **M. lepraria** Rbl. Considerably larger than *T. sepiaria*, the lines of the forewing on the reverse sides shaded with brownish, the postmedian sharply dentate on the veins. Hindwing lighter. Fringes not dark-chequered. Otherwise similar to *sepiaria* but with 4 well developed spurs. Costal vein of hindwing not mentioned, presumably not anastomosing. Buda-Pesth.

fatimaria. **M. fatimaria** B.-Haas (= *ismailaria* Ob.) is very distinct from *codetaria* and *oranaria*. White-grey, the forewing dusted throughout with black-brown; the antemedian line runs obliquely out from costa to median vein, is very acutely angled, strongly curved inwards and again angled outwards at hindmargin; median area strigulated with black and light brown; post-median line with sharp black dashes on the veins and a proximal curve behind the 3rd radial, also indicated by dashes on the hindwing. Underside uniform grey, postmedian line feebly indicated. Costal vein of hindwing not mentioned. South Oran (Algeria).

oranaria. **M. oranaria** Stgr. is unknown to me. BANG-HAAS considers it an *Egea*, but according to STAUDINGER the costal vein of the hindwing anastomoses with the subcostal even more strongly than in *oppositaria*. Forewing dark grey, with indistinct dentate blackish antemedian line and dentate black, distally white-bordered postmedian. Hindwing lighter grey with a very faint postmedian row of dots. Superficially very like *Egea cacuminaria*, the line distally to the postmedian not so sharply white, the whitish streaks on the median and submedian veins wanting. Antennal pectinations as in *sepiaria*. Oran (Algeria). — **castiliaria** Stgr. (25 l) is possibly a form, possibly a near ally of *oranaria*, smaller and paler, with the lines broken up into dots. The larva was beaten from low plants, especially *Thymus vulgaris*, but was not specially observed. Castile.

M. oxygenaria *Püng.* Larger, forewing with sharper apex, costal margin more sharply arched at base, *oxygenaria*. hindwing more elongate, with longer inner margin; forewing grey mixed with brownish, the lines finely blackish, on the reverse sides whitish margined, antemedian from one-fourth of costa obliquely to the median vein and from here in a sharp angle to the hindmargin, post-median from quite near the apex, gradually receding from the distal margin, slightly undulate, at the 2nd submedian bent, thence running outwards to the hindmargin near the anal angle. Hindwing pale grey, distally a little darker-dusted, a fine dark, distally lighter-edged postmedian line. Merv.

133. Genus: **Pachycnemia** *Steph.*

Face rounded, rather prominent, with appressed scales. Palpus moderately elongate. Tongue developed. Antenna rather short, in ♂ somewhat thickened, lamellate, with minute ciliation. Abdomen slender. Wings smoothly scaled. Forewing without fovea; very elongate, costal margin gently curved, distal margin smooth, gently curved, oblique but short, costal vein widely removed from 1st subcostal, 2nd subcostal arising free, often anastomosing or connected with the 1st or with the 3rd—4th. Hindwing elongate but more ample than forewing, 3rd submedian vein running to the anal angle. Only one species known, of quite peculiar habitus. In repose the wings are more closely folded than in most Geometrids.

P. hippocastanaria *Hbn.* (= *degenerata* *Hbn.*, *difformaria* *Hbn.*) (22 a). Forewing glossy whitish grey, *hippocastanaria*. densely irrorated with red-brown, the basal and distal areas sometimes lighter; lines thick, obscurely whitish, the antemedian strongly angulated. Hindwing dirty whitish, feebly marked. — Larva cylindrical, wrinkled transversely, grey-brown, marbled with darker brown, with black dorsal dots and rows of whitish subdorsal and lateral spots. On *Calluna*, resting rigidly, like a twig of the plant. The moth is double brooded, April and again in July—August. Local in Central and S. Europe, N. Africa and perhaps Asia Minor.

134. Genus: **Rhoptria** *Guen.*

Face with appressed scales. Palpus moderate, stout, coarsely scaled. Antenna in ♂ thickened and flattened, very minutely ciliated. Forewing with apex rather sharp, distal margin moderately oblique; neu-ration very variable, 1st subcostal generally arising from 2nd and anastomosing with costal, its base, however, always very slender, often obsolete, so that it arises from the costal; other irregularities also occur. Hindwing with costal margin rather long and straight, apex rounded, distal margin subcrenulate. Only 1 or 2 species. The shape and facies are so distinct as to justify the provisional retention of GUENÉE's genus, although it would be quite possible to follow LEDERER and merge it in the already heterogeneous *Gnophos*.

R. asperaria *Hbn.* (= *collata* *Hbn.*) (22 a). Very variable in the intensity of the markings, but it is *asperaria*. not necessary to subdivide the banded forms, all of which show the same general distribution of the colours, an oblique median band being pale, a band proximally to it (the true „median shade“) very dark (at least in part), a distal band moderately dark. — ab. *pityata* *Rbr.* is almost or quite unicolorous. — Larva short, without *pityata*. protuberances, ventral surface slightly flattened, segmentation distinct. Variable in colour, grey or washed with ochreous, or dull reddish, or vinous, the lines not sharply expressed, the spiracular line oftenest brick-red. On *Cistus monspeliensis*. *asperaria* is probably single brooded and flies freely by day. Distributed in the Mediterranean lands.

R. semiorbiculata *Chr.* (= *exulta* *Btlr.*) (22 a) may be provisionally referred to this genus. Pale grey *semiorbiculata*. with a slight rufescent tinge, the lines thickened at costa, angulated subcostally, thence oblique and undulate, continued on hindwing; median line of forewing not or scarcely indicated except as a large spot at costa; a dentate subterminal line, dark-edged proximally and distally. Amur and Ussuri district, Japan and W. China. — **brunnearia** *Leech* is smaller, pale brown, the forewing with a blackish blotch near the hinder angle, *brunnearia*. the dentate subterminal line almost wanting. Omei-shan, one example, perhaps a mere aberration.

135. Genus: **Gnopharmia** *Stgr*

Face with strong protuberance. Palpus moderate, rough-scaled. Tongue developed. Antenna of ♂ bipectinate with long branches, apex simple. Forewing with fovea; margins rather straight; 1st—2nd subcostal coincident. Hindwing with distal margin rounded, not crenulate. Only 2 or 3 species, all Palearctic, ranging only from Palestine to Central Asia. I have seen only the type species (*colchidaria*), which combines the aspect of *Gnophos* with the structure of *Boarmia* or *Tephрина*.

G. colchidaria seems to be very variable, in part at least geographically. Some of its forms bear a decided superficial resemblance in coloration to those of *Gnophos variegata* but it is easily distinguished by

colchidaria. its shape, its small black discal dots, straighter postmedian line, etc. — *colchidaria* *Led.* (22 a) is the darkest form, the upper surface being mostly dark fuscous. Ili and Issyk-kul and probably Transcaucasia. — *cocandaria* *Ersch.* (= *degeneraria* *Stgr.*) is paler, the upperside fuscous grey or yellowish grey, underside dirty whitish with broad fuscous border. Transcaspia and Mesopotamia. — *objectaria* *Stgr.* (= *cocandaria* *Chr. nec Ersch.*) has the upperside greyish, variegated with ochreous or reddish, the distal area darker, the underside white with the black border very broad. The prevailing form in the Zerafshan district, but also recorded from the same localities as the preceding.

maculifera. **G. maculifera** *Stgr.*, also from Zerafshan, is considered to be perhaps a Darwinian form of *colchidaria*. It is whitish grey with the bands formed of blackish grey spots. The underside sometimes lacks the dark borders. Samarkand.

rubraria. **G. rubraria** *Stgr.* is distinguished by the brown-red coloration of the forewing. Variable, the markings not sharp except the costal spots, light subterminal line and in some examples black marginal dots. According to the figure, broader-winged than the preceding. S. E. Taurus, Antiocha and Palestine. — *subrubraria* *Stgr.*, from Ferghana, is a more greyish form, thus intermediate towards *colchidaria*.

136. Genus: **Pseudognophos** *Stgr.*

Face not protuberant, scarcely rough-scaled. Palpus short, moderately stout. Tongue developed. Antenna in ♂ simple. Forewing with distal margin smooth, oblique; 1st—2nd subcostal coincident; fovea wanting (?). Hindwing with distal margin weakly undulate.

Probably a superfluous genus, differing little, if at all, from some of the smoothest-margined species of *Boarmia*; but I have seen only the ♂.

ardinata. **Ps. mardinata** *Stgr.* (22 a). A not very striking species, the dirty-white (in places slightly yellowish) ground-colour very densely irrorated with fuscous, the usual lines of *Boarmia* present, but only moderately strong; antemedian indented near costa, then curved outwards, median shade irregular, strongest in the angle of the median vein and its 2nd branch, then bending basewards to touch the antemedian on the fold, postmedian line forming a series of lunules, the deepest placed on the folds, a dark distal spot between the radials. Underside less strongly irrorated, weakly marked. Mesopotamia: Mardin.

137. Genus: **Gnophos** *Tr.*

Face usually prominent, with appressed scales. Palpus short or moderate, shortly rough-scaled. Antenna in ♂ simple, or bipectinate with short or moderate branches. Fovea wanting or (in a few doubtfully placed species) slight. Forewing usually broad, with distal margin less oblique than in *Boarmia*, sometimes crenulate; all veins present, the anastomoses of the subcostals very variable. Hindwing with distal margin often crenulate or dentate; 2nd radial wanting. A variable genus in structure and one which has never yet been quite satisfactorily defined. Often more easily recognized by markings than structure, the ringed discal spots and the general grey coloration being characteristic though not universal features. A few ♀♀ are apterous or semi-apterous. — Egg usually with more or less strong longitudinal (interpolar) ridges and slighter transverse ones, forming a reticulated pattern. Larva rather stout and rugose, generally with small humps or raised points on the 8th abdominal segment. On low plants. A few more slender, smoother, *Rhamnus*-feeding species are perhaps not truly congeneric. The moths are mainly mountain species and are to be found sitting on rocks with wings outspread. Chiefly Palearctic, with stragglers in N. India, Africa and America.

A. Distal margins crenulate. Antenna in ♂ bipectinate (*Ctenognophos* subgen. nov.).

eolaria. **G. eolaria** *Guen.* (= *obtectaria* *Walk.*, *paganata* *Feld.*, *tenebrosaria* *Moore*) (22 b). The type of my subgenus *Ctenognophos*. A large species, variable on the upperside but with a distinctive and fairly constant underside — glossy greyish white with postmedian row of dots and broad fuscous marginal band. Above varied brown and fuscous, sometimes with partial or complete whitish band in the neighbourhood of the dentate black postmedian line. — ab. *fuscobrunnea* *Warr.* is „dull rufous brown without any pale dusting.“ — ab. *paerlita* *Btlr.* is more uniform greyish, the lines broken into dots. — Distributed throughout the Himalayas, and reaching W. China.

incolaria. **G. incolaria** *Leech* (22 b) seems sufficiently distinct from all the forms of *eolaria*, forewing rather less acute at apex, the brown coloration giving place to dark blue-grey, the median area white with slight brown clouding distally to the cell. Hindwing beneath with the dark border narrowed. Only known from Kwei-chow.

lichenea. **G. lichenea** *Ob.* (22 b). Forewing still more rounded, rather less broad. May be known by the remarkable mixture of olive, pinkish, black and white scales, the white sometimes prominent as a patch towards the end

of the cell. Underside dull brown-grey, feebly marked. W. China and Chang Yang. In this species and the 3 following the 1st and 2nd subcostal veins are free.

G. theuropides *Ob.* (22 c) differs in its pale ground-colour (light grey) and more definite markings. *theuropides*. There is nearly always a pale band distally to the postmedian line, followed by an olive-green shade which forms the proximal edging of the dentate subterminal line. W. China and Tibet.

G. mandarinaria *Leech* (22 b). Also closely similar, ground-colour almost white, the dentate black *mandarinaria* lines rather thick and sharply expressed. W. China: Wa-shan.

G. punctivenaria *Leech*. Ground-colour almost as white as in *mandarinaria* but with a very slight *punctivenaria* violet-grey (or sometimes more rosy) tinge. Larger, the lines not quite so deeply dentate, chiefly emphasized as black dots or dashes on the veins. Subterminal line very indistinct, not deeply dentate, its proximal olivaceous edging weak or interrupted. W. China.

G. fumosa *Warr.* is very close to *ventraria* *Guen.* (which will be described and figured in vol. 12 of the *fumosa*. „Macrolepidoptera“) but the forewing is said to be more rounded at the apex; both wings smoky fuscous, with only the central area towards the costa slightly paler; the markings always very indistinct. Underside like *ventraria* but with a submarginal fascia always darker. Not variable. Japan.

G. stevenaria *Bsd.* (= *lapidisaria* *Frr.*) (22 b). A rather small or moderate-sized light violet-grey species *stevenaria*. with large costal spots at the origin of the fine (usually broken into dots or almost obsolete) dark lines and of the usually obsolete median band. Hindwing strongly crenulate, generally with a longer tooth at the 3rd radial. Underside dirty whitish, strongly irrorated with grey and slightly darkened from the postmedian line to the distal margin. — *cataleucaria* *Stgr.*, a frequent aberration, if not a local race, in the Mardin district, *cataleucaria*. has the underside cleaner white proximally and darker fuscous distally, the discal dots sharply expressed. A dark form from the Crimea perhaps indicates another race. *stevenaria* has a local distribution from S. E. Europe to Palestine and Transcaucasia.

B. Distal margin (at least of hindwing) crenulate or undulate. Antennae in ♂ nearly always simple (*Gnophos*).

G. dumetata *Tr.* (= *temperata* *Ev.*) (22 c). Larger than *stevenaria*, more brownish, with less enlarged *dumetata*. costal spots, upperside usually with conspicuous discal dots, that of the forewing sometimes lost in the median shade. Underside without darkened distal area, postmedian line usually indicated by vein-dots. — *daubearia* *B.* *daubearia*. is a form with brown-whitish ground-colour, chiefly from the South of France. — *scopulata* *Fuchs* is treated *scopulata*. by STAUDINGER as the same as *daubearia*, but FUCHS denies this, as the ground-colour is more ashy whitish (not brownish) and the postmedian line better developed. Rheingau. — *saturata* *Fuchs* is dark chocolate brown, *saturata*. with still darker borders. Hungary. — The egg hibernates. Larva somewhat elongate, without protuberances, only the tubercles rather prominent; flesh-colour, darker dorsally, the black dorsal line broken on the thorax and 1st—4th abdominals into dashes, followed, at the ends of these segments, by transverse yellow marks; side with yellow spots. Reared by MILLIÈRE on Rhamnus (the form *daubearia*). Very local in Central and S. Europe, August—October. Like *eolaria* and *stevenaria*, this species has the 1st subcostal arising from the 2nd and anastomosing with the costal.

G. zacharia *Stgr.* is quite differently coloured, clear grey (not brown), strongly dark dusted, without *zacharia*. dark distal band, etc. Face concolorous with wings, not (as in *sartata*) black. Amasia, in the autumn.

G. furvata *Schiff.* (22 b). A large, rather obscurely coloured species, grey with a tinge of brown, the *furvata*. median area usually somewhat darker, the discal spot of the forewing somewhat annular, approaching the form prevalent in the *obscurata* group. The ♀ is generally larger and lighter than the ♂. — Egg barrel-shaped, with well-developed longitudinal ribs, the furrows crossed by slight ladder-like ridges. Larva stout, cylindrical, with 2 small dorsal points on the 8th abdominal and slight anal points; yellowish or reddish brown with dark dorsal line, distinct only on the first few segments. On low plants, hibernating young. Moth in July—August, Central and parts of Southern Europe.

G. approximaria *Leech* (22 c as *approximataria*). Narrower winged than *furvata*, much more glossy, *approximaria*. darker brown with slight olivaceous tinge and with some light bluish scales here and there. Median area not darkened, except by a thick median line placed near the postmedian. Evidently related to the following, but darker, less variegated, much less green, forewing with 2nd subcostal arising from stalk of 3rd—5th, anastomosing with 1st. W. China: Pu-tsu-fang.

G. muscosaria *Walk.* (= *vitreata* *Moore*) is a more greenish Indian species of similar shape but with *muscosaria*. the 2nd subcostal arising from the cell and usually free. Underside lighter than in *approximaria*, especially distally and on the hindwing, the postmedian line more distinct. The name-typical form has a strong cupreous admixture, especially in the distal area, and the green parts are more or less olivaceous. Chiefly from

sempervirens. Sikkim, but I have seen a nearly similar example from Omei-shan. — *sempervirens* *nom. nov.* (= *vitrea* *Hmps.* nec *Moore*) is a much more uniform, sap green form. N. W. Himalayas. Also from Ta-chien-lu.

nimbata. **G. nimbata** *Alph.* (22 c) is distinguished by its elongate forewing (the distal margin unusually oblique for this genus) and by its light flesh-coloured or yellowish tinge. The markings are rather weakly expressed, on the glossy underside scarcely discernible. Ferghana, Issyk-kul, Ili and Kashgar.

perspersata. **G. perspersata** *Tr.* (= *respersaria* *Hbn.*, *nom. praeocc.*) (22 d). Both wings with as light brown tinge and with strong browner irroration and strigulation. All the 3 lines of the forewing present, but usually weak, somewhat dark-spotted at the costal margin and on the veins. Discal dots very small. Under surface without the dark sprinkling, discal dots present, postmedian line faintly discernible. Neuration of *dumetata*. — *chalcona*. *Ob.* is a more whitish-grey Spanish form with distinct lines. — *ochrea* *Ob.*, also from Spain and Portugal, is darker, rather uniform ochraceous brown, weakly marked. — Larva cylindrical, without protuberances, dark grey with fine yellowish dorsal and subdorsal lines and yellow lateral spots, followed on the abdominals by small dark spots. On *Rhamnus*, *Genista* and *Spartium*. Moth in June—July in Spain, Aargau and Dalmatia.

sartata. **G. sartata** *Tr.* (= *imundata* *Warr.*) (22 c). Rather broad-winged, distal margin of hindwing strongly and rather unevenly crenulate. Forewing with 1st subcostal free. Not very variable, now greyer, now browner, always with a dusted appearance, median shade rather thick, postmedian line dotted, a characteristic light spot in middle of distal area. Underside generally with conspicuous, broad brown or fuscous distal border, with whitish apical and central spots. Face black. ♀ considerably larger than ♂. Larva moderately slender, reddish grey with black tubercles. On *Rhamnus* and low plants, in the spring. Flies in June and July. Corsica, Sicily, S. E. Europe, Asia Minor, Syria and Transcaucasia.

snelleni. **G. snelleni** *Chr.* (25 b). Size of *sartata*, somewhat similar on the upperside but more variegated with brown, the dark markings rather better expressed, median shade of both wings more bent, a lighter spot at apex; underside yellowish white, with black discal spots, median shade and broad distal border, the latter with the white apical and mid-terminal spots very sharply contrasted. Face brownish, not black. Transcaspia to Central Persia.

accipitraria. **G. accipitraria** *Guen.* differs from *snelleni* in its very much larger size (often quite a giant among the *Gnophos* species), lack of pale apex to forewing both above and beneath, less developed black border on the hindwing beneath and the substitution, on the under surface of both wings, of a postmedian line or shade for the median. Distributed in the N. W. Himalayas. — *superba* *subsp. nov.* (22 k) is a large, clearer grey form, the yellow-brown shade confined to some of the veins, but here exceedingly bright, discal spots enlarged, underside purer white with deeper black markings, the distal border of the hindwing restricted to a large spot anteriorly to the 1st radial but not reaching the costal. W. China: Omei-shan (type, ♂, May—June); Mou-pin (cotype, ♀, July) both in coll. Brit. Mus.

obscurata. **G. obscurata** *Schiff.* (= *lividata* *F.*, *notata* *Walk.*, *bivinctata* *Fuchs*) (22 d). An extremely variable species in coloration, generally recognizable by its deeply crenulate hindwing, weakly marked underside, large discal rings and by the form of the lines. SCHIFFERMÜLLER's type, as diagnosed by FABRICIUS (who needlessly changed the name) represented the moderately dark ash-grey form, generally with the black lines sharply expressed, from which the slightly more brownish-mixed examples (*anthracinaria* *Esp.*) or purplish-tinged (*quadripustulata* *Don.*) need not be separated. — ab. *pallidemarginata* *Ob.* has both wings pale from the (obsolescent) subterminal line to the distal margin. — *obscuriorata* *Prout* (= *saturata* *Prout*, *mediorhenana* *F. Fuchs*, *atra* *Linstow*, *maugrabinearia* *Ob.*) represents the various shades of very dark brown and black which the species assumes in parts of England and Germany, chiefly on peat soil. — *calceata* *Stgr.* (= *serotinaria* *Haw.* nec *Hbn.*) is a local race from the chalk soil of the South of England with the ground-colour whitish. — ab. *mundata* *Prout* (= *calceata* *Ob.*) is a beautiful and rare aberration of *calceata* with no dark dusting at all—white with black lines and rings. — ab. *fasciata* *Prout* (= *bicolor* *Ob.*) also occurs among *calceata*, but only in the Folkstone district, and has the median area alone darkened. — *argillacearia* *Stgr.* (= *pullata* *Dup.*) is a clay-coloured or sandy (sometimes almost reddish) form which occurs locally on sandstone soils in England and France, I think always as a mere aberration. — *bellieri* *Ob.* is also brownish but much more variegated with white, the lines very strong and sharp, underside well marked. Corsica. — *lafaurayata* *Ob.* is a dwarf race, of a dark colour but dotted here and there with ochreous, the markings strong. Bordeaux and Dax. — *zeitunaria* *Stgr.* is a large race, otherwise similar to *lafaurayata*. S. E. Taurus. — For a more detailed account of the variation see *Trans. City Lond. Ent. Soc.* vol. 13, p. 31—30; OBERTHÜR *Ét. Lép.* vol. 7, p. 307—309. — Egg irregularly

oblong, about twice as long as broad, with deep longitudinal furrows, connected by slighter transverse ones; glossy, red. Larva short and stout, grey marbled with brown, dorsally blackish, the tubercles tipped with white, 8th abdominal with a pair of small pointed eminences. On *Helianthemum*, *Poterium*, etc., but will eat almost any low plant. Hibernates. Moth July—September, Europe and Asia Minor.

G. mardinaria *Stgr.* Scarcely distinguishable on the upperside from weakly marked examples of *obscurata* ab. *argillacearia*, the black marginal line obsolescent. Underside more yellowish than in *obscurata*, but characterized by having a broad dark (sometimes blackish) distal border to both wings. In the forewing the 2nd subcostal vein arises from the cell, while in *obscurata* it is from the stalk of the 3rd—5th; but this may prove variable. The distal margin of the hindwing has longer teeth. Mesopotamia. Generally larger than *obscurata*.

G. canariensis *Rbl.* appears quite like a rather small, rather dark, weakly marked *obscurata*, but the ♂ *canariensis* genitalia show it to be a separate species. Canaries.

G. crosi *Th.-Mieg* (= *omaria* *Ob.*) is superficially very closely similar to the most yellowish *crosi*. brown or reddish brown forms of *obscurata* but distinct in structure, the antenna of the ♂ being shortly bipectinate, on which account it should possibly be referred to the following group. The discal mark of the hindwing is sometimes small or obsolete and the underside is almost markingless. W. Algeria: Mascara to S. Oran Geryville and Aflou), August—September.

G. onustaria *H.-Sch.* (= *oneraria* *Guen.*, *serraria* *Guen.*, *catenulata* *Rbr.*) (22 d). Similar to *obscurata* *onustaria*. *calceata* but less glossy, the dusting coarser, a slight brown tinge in places, postmedian line more sinuous, with longer teeth on the veins, distal margin with the dark line of *obscurata* broken up into dots, underside less weakly marked. The distal margin of the hindwing appears less deeply crenulate. Spanish specimens are often very small, but I can find no evidence of two races. — Egg yellow changing to reddish, marked with not very strong longitudinal ridges and slight, irregular transverse ones. Larva rather stout, roughened and with lateral protuberances; pale brick-colour. On *Polygonum*, *Rumex*, etc. in 2 broods, the second hibernating, S. Europe to Syria and N. Persia.

G. pentheri *Rbl.* is said to be near *ambiguata*, the ♂ antenna with the ends of the joints more sharply *pentheri*. projecting, the forewing with blunter apex, the colour much lighter white-grey, the distal margin quite unmarked. Only known from high altitudes in Herzegovina, July.

G. ambiguata *Dup.* (= *meyeraria* *Lah.*, *ophthalmicata* *Led.*) (22 c). Distal margin of hindwing again *ambiguata*. less strongly crenulate than in *onustaria*, of forewing smooth. Colour and markings similar but more uniform, the lines less deeply dentate, underside weakly marked. Altogether a rather sober-looking species. Inhabits the mountains of Central Europe, the Altai and Ala Tau. — **pullularia** *H.-Sch.* (= *vepretaria* *Spr.*) (22 d) is a *pullularia*. more densely irrorated, thus darker race from Central and N. E. Germany. — ab. **nigrescens** *Hannemann* is *nigrescens*. unicolorous black-grey with black veins. — **graecaria** *Stgr.* is more whitish, weakly marked. Greece. — Larva *graecaria*. short and rugose, the tubercles pointed, especially the lateral ones; brownish yellow with light dorsal spots bounded by curved dark stripes. On low plants, hibernating. Imago in July.

G. fractifasciaria *Püng.* Similar to *ambiguata* but with longer palpus, more slender ♂ antenna, finer *fractifasciaria*. dark dusting and more sharply angulated postmedian line. Distal marginal dots sharply black. Alexander Mountains, Central Asia.

G. orbicularia *Püng.* is also related to *ambiguata*, but smaller and more slenderly built, the forewing *orbicularia*. more pointed, more finely and regularly scaled, the lines less dentate, the postmedian line and the ♂ antenna more as in *fractifasciaria*. Issyk-kul.

G. püngeleri *Bohatsch* (= *orbicularia* ♀ *Püng.*, nec ♂). ♂ considerably larger than *orbicularia*, the *püngeleri*. forewing longer but not so pointed, both wings unicolorous grey, densely scaled, the postmedian line more distinct and less dentate, not whitish edged distally. Discal spots subobsolete, marginal line wanting, fringe concolorous, unmarked. Underside lighter, almost markingless. ♀ smaller and more robust than ♂, with more pointed forewing. Alai district. PÜNGELER'S ♀, at first misidentified, was from Togus-Torau.

G. stemmataria *Ev.* is only known from the original description. It is said to be shaped like *Cosymbia stemmataria*. *orbicularia*, only rather larger. Brownish grey, irregularly irrorated, discal spots small, black or brown-black, with a small or distinct white pupil; postmedian line very fine, scarcely noticeable, but marked with black vein-dots; a blackish terminal line. Underside somewhat paler, discal spots not very sharply expressed, here not white pupilled, hindwing with a slight dark shade before the distal margin, no other markings. Noor-Zaisan.

G. pullata *Schiff.* (22 d) somewhat resembles on the upperside certain forms of *glauzinaria* (*supinaria*) *pullata*. but is characteristic on the underside, which is glossy uniform grey with a white postmedian line or narrow band. Costal margin of forewing proximally rather more curved than in most of the allies, apex not very sharp,

hindwing moderately deeply crenulate. The name-type is light grey with a slight bluish tinge, the lines expressed chiefly by dark (rarely black) dots on the veins. — *nubilata* Fuchs (22 d) is dark glossy smoke-colour with a whitish line (usually interrupted) indicating the distal edge of (obsolete) postmedian line. Rheingau. — *conferata* Stgr. (= *conferta* Ob.) is an intermediate form, a dusting of the pale ground-colour remaining, the white line (or band) broader. S. Tyrol, Carinthia, Styria, Puy-de-Dôme. — *impectinata* Guen. (22 d) is a very pale, whitish (in OBERTHÜR's figure slightly brownish) form from the Basses-Alpes, S. Carniola and with the type in Switzerland. — *canitiaria* Guen., also from the Basses-Alpes, was differentiated by the pectinate ♂ antenna. STAUDINGER considers the type to have a wrong head affixed, but OBERTHÜR denies this and believes it will prove a twin species. — ab. *albarinata* Mill. is a development of *impectinata*, white with the median area forming a grey band. — *pyrenaica* Ob. is a rather dark, more brownish race, with the median area somewhat differentiated in colour and sharply light-bounded, recalling *obscurata bellieri*. Pyrenees-Orientales. — Egg oval, finely shagreened, red. Larva stout, cylindrical, with small dorsal points on the 8th abdominal; light grey, dorsal line blackish on thorax and posterior segments, yellow-grey between, white-edged throughout and accompanied by some oblique dark streaks; lateral light stripe black-edged above; venter violet-grey with double mid-ventral line of blackish spots. On low plants, hibernating. Imago in July, in Central Europe.

orphninaria. **G. orphninaria** Hmps. On an average rather larger than *pullata*, distal margins more strongly crenulate, ground-colour more brownish, the irroration dark blue-grey, so strong as to leave only the median area and a spot in the middle of the distal area brownish. Afghanistan and Kashmir, July—September.

deliciaria. **G. deliciaria** Ob. is much brighter, the coloration of the upper surface about as in *variegata*, the lines much more sharply expressed than in the two preceding, the postmedian of the forewing more angulated at the 1st radial. The underside is much less uniform than in them, the forewing showing, in addition to the pale brownish postmedian band a marginal band of the same pale colour, containing only a few dark marks, the hindwing predominantly pale brownish. Ta-chien-lu; ?Hou-kow (Tibet), a darker ♀ ex coll. LEECH.

perdita. **G. perdita** Stgr. „Dark grey dusted with yellowish, with large dark central dots, otherwise almost markingless; one observes merely traces of the dentate dark postmedian line and the whitish subterminal.“ Expanse 34 mm. (German measurement.) Vladivostok. Founded on a double confusion, LEECH having (probably in error) determined it as *paerlita* Btlr., which STAUDINGER misread. When re-discovered, it will probably require a new name.

difficilis. **G. difficilis** Alph. (= *desparataria* Fuchs) (22 d). Size of *pullata*, forewing more elongate, coloration of upperside somewhat as in *orphninaria* but rather lighter, without conspicuous pale patch in distal area. Underside pale brownish with some dark dusting, leaving clear a broad pale band distally to the (scarcely indicated) postmedian line; distal area somewhat darkened; apex and a spot in middle of distal area lighter.

grumi. Hindtibia of ♂ dilated. — **grumi** nom. nov. is a more uniformly light-brown race from Gounansy, Tétoune (?Tatung) Mountains, W. China (Kan-su). Mentioned by ALPHÉRAKY, Rom. Mém. vol. 9, p. 58. Possibly

korlata. the same as — **korlata** Fuchs, which is said to be smoothly scaled, colour especially in basal and median area clay-yellowish, with the costal margin clay-colour and the veins brown. Korla. — **uniformis** Stgr. is much

uniformis. more uniform leaden grey, only in the median area very slightly mixed with yellow-brown scales, discal rings scarcely pale-centred, on the underside more sharply prominent than in typical *difficilis*. Ala Tau and Eastern Thian-Shan. Possibly as separate species or a form of the following. — *difficilis* inhabits Ferghana, Kashgar, the Issyk-kul district, etc. May—June.

stoliczkaria. **G. stoliczkaria** Moore (22 e) is very similar to weakly-marked *difficilis* but the distal margin of the hindwing less crenulate, the ♂ hindtibia not dilated. Very light brownish, finely and uniformly dusted with darker brownish, the discal rings not very sharp, lines only indicated by dots on the veins, distal margin with weak dark dots or lunules. Underside paler, almost unmarked. Ak Masjid, S. of Yarkand, early June.

farinosata. **G. farinosata** Chr. Yellowish grey, closely irrorated with fuscous, antemedian line faint, postmedian dentate (median area rather narrow), discal rings normal. Underside dirty whitish, with blackish band close to the distal margin, that of the forewing leaving free an apical spot and interrupted between 3rd radial and 1st median, that of hindwing similar, but narrowly joined proximally between the veins mentioned. Transcaspia.

vastaria. **G. vastaria** Stgr. On an average rather larger than *variegata*, rather narrower winged, hindwing less crenulate, ground-colour similar, light yellow-grey, the fine darker grey irroration not arranged in striae, no darker yellow clouding, the grey clouding weak, chiefly apparent in the distal region, especially anteriorly, the lines rather more approximated; underside whitish with narrow, interrupted blackish borders — subapical, enclosing a white apex, and (still smaller) posterior fragments alone remaining. Discal dots rather variable.

rubefactaria. ♂ antenna appreciably ciliated. Issyk-kul and Kashgar. — **rubefactaria** Püng. is a bright reddish race from Togus-Torau.

G. praestigiaria Püng. Very near the preceding, forewing narrower and more pointed, hindwing more *praestigiaria*. deeply crenulate, ground-colour duller, not so reddish as in *rubefactaria*, the black borders of the underside more indistinct but more regular, not interrupted in the middle. Togus-Torau and a somewhat greyer form from Aksu.

G. rufitinctaria Hmps. (22 e) has the colours more as in *variegata*, sometimes more reddish. Variable *rufitinctaria*. but easily distinguished from both *vastaria* and *variegata* as follows: costal margin of forewing more arched, hindwing still more strongly crenulate than in *variegata*, discal ring of forewing larger, colours differently arranged, the strongest grey shading being in the median area, distal margin with deeper black dots, fringe more sharply chequered. The underside is intermediate between the two allies. Antenna of ♂ not appreciably ciliated. Koksar, etc. (N. W. Himalayas). In this species and *vastaria*, as in *variegata* and *mucidaria*, the 1st subcostal of the forewing regularly anastomoses with the costal; this and the pattern of the underside suggests that STAUDINGER's interposition of several species with other neurulation and pattern is not quite natural.

G. glaucinaria Hbn. (22 e). Very variable in colour, generally recognizable by its shape and facies *glaucinaria*. but especially unmistakable on the under surface; here the forewing is more or less smoky as far as the post-median line (or occasionally clearer but with the line itself sharply expressed), then with a broad whitish band, finally with a dark border, leaving free a whitish spot at apex and more or less white interruptions in the middle and posteriorly; the hindwing less or not at all darkened proximally, otherwise similar. The name-typical form is variegated, the ground-colour pale yellowish, a strong blue-grey dusting in the median and subterminal regions. — **plumbearia** Stgr. (= ?*panessacaria Trimoulet*) (22 e) is a small, dark leaden-grey *plumbearia*. form with indistinct fine pale lines. It is recorded as a local race from S. W. Germany and probably S. W. France. — ab. **milvinaria** Fuchs occurs among *plumbearia* but differs in having the dark grey mixed with ochre-yellow. *milvinaria*. Middle Rhine. — **falconaria** Frr. (= *sartaria H.-Sch.*) is almost unicolorous cinereous with a slight viola-*falconaria*. ceous tinge. Frequent in the Alps, etc. — **supinaria** Mann is like the most glossy, weakest-marked *falconaria* *supinaria*. on the upperside but beneath more resembles *pullata*, both wings showing a broadened dark border, frequently not at all relieved with whitish except at apex of forewing. Croatia, Dalmatia, etc. — Egg red, regularly oval, with longitudinal rows of minute cells. Larva similar to those of *obscurata* and *pullata* but with a well-marked light lateral band. On low plants, hibernating. The moth appears in May and again in August and may be regarded as one of the commonest species of the genus, though chiefly confined — apart from the following doubtful races — to Central Europe and Asia Minor. — **pollinaria** Chr., unknown to me, is probably *pollinaria*. a separate species. Forewing more pointed, ground-colour yellowish-ashy, densely irrorated with fuscous, the distal area darkened, especially beneath; according to the figure the subterminal line on the upperside has a distinct fine blackish proximal edging. Asia Minor, Transcaspia and Issyk-kul. — **sibirata** Guen. (22 e) is *sibirata*. also likely to be a species. Rather large; distal margin of forewing slightly more oblique than in *glaucinaria*, colour ochraceous, strongly dusted and marbled with fuscous, the markings on the upperside vague, the postmedian line apparently more sinuous anteriorly; underside of both wings sharply marked, otherwise nearly as in *supinaria*. Altai, Uliassutai and Amdo districts.

G. crenulata Rbr. (25 k) is possibly a form of *glaucinaria* but is undescribed and little can be stated *crenulata*. definitely from the figure. Larger, the ground-colour apparently about as in *sibirata*, little variegated, post-median line strongly expressed both above and beneath, crenulate. Distal dark border beneath not broad, separated from the margin by a pale space, on the hindwing not interrupted behind the 3rd radial. Andalusia: Sierra Nevada in August. — **etruscaria** Stgr. is doubtfully referred here, but is said to be bluish grey, *etruscaria*. dark dusted, the markings weak excepting the cellmark and postmedian line, hindwing almost unmarked. Underside much less sharply marked than in *glaucinaria*, more as in *supinaria*. Vallombrosa (Apennines) in June.

G. gnophosaria Ob. (described as *Psodos*) (22 e) is unknown to me, but seems likely to belong here, as *gnophosaria*. LEECH has suggested. The coloration of the upperside is nearly as in name-typical *glaucinaria* but the lines are more sharply blackish, that of the hindwing placed further from the discal ring. The underside is characterized by strong discal spot and postmedian line on both wings, the border of the hindwing somewhat as in weakly-marked *glaucinaria*, that of the forewing traversed by a continuous pale subterminal line on a somewhat irregular blackish ground. Ta-chien-lu.

G. ochrofasciata Stgr. (22 f) resembles *glaucinaria* in the markings of the upperside but the hindwing *ochrofasciata*. is less deeply crenulate and the coloration is nearer that of *variegata*, ochreous brown with blue-grey dusting in the basal area and distally to the postmedian line. Underside with cell-spots and dentate postmedian line, but without the sharp colour contrasts of *glaucinaria*. Hindtibia of ♂ dilated. Uliassutai, Issyk-kul, Koko-Nor.

G. finitimaria Fuchs is perhaps a pale, weakly marked form of *ochrofasciata*, the upperside more finely *finitimaria*. and regularly dusted, without such definite dark shading proximally to the subterminal, the distal area greyer,

the discal marks smaller, scarcely pupilled, fringe of forewing dark-spotted, underside more weakly marked. the postmedian line not dentate. Krassnoiareck, E. Siberia. STAUDINGER records transitions from Kashgar and Koko-Nor.

creperaria.

G. creperaria Ersch. (25 g) is a little-known species and the underside has been neither described nor figured. Apparently similar to *ochrofasciata* but with more sharply defined areas, the basal and postmedian entirely blue-grey, the median brighter ochreous than in the species named, the distal darker; postmedian line, according to the figure, rather straight; discal rings small; hindwing not very deeply crenulate. Possibly near *orphninarina* and *deliciaria*. Siberia: Irkutsk, Dauria, etc.; ?Kan-su.

agnitaria.

G. agnitaria Stgr. (24 c) appears to be somewhat smaller and narrower, dark-coloured with a strong sprinkling of dirty yellowish, the dentate postmedian line light-edged distally; discal rings normal. Both wings beneath grey in proximal half (with scarcely noticeable discal dots), bounded by a narrow dark band, to which follows a light yellowish white band, fading out gradually into the darker, light-dusted distal area; fringes beneath light yellowish, with darker tips, that of forewing weakly chequered. Askold.

mutilata.

G. mutilata Stgr. resembles *variegata* and *mucidaria* but has the forewing much more pointed, the hindwing scarcely crenulate, the ♂ antenna more strongly serrate than in *variegata*, but not pectinate. The ochreous lines of the forewing are frequently connected at the hindmargin in K-shape. Underside without distinct markings except the cell-spots. Asia Minor, Syria and Mesopotamia.

lutipennaria.

G. lutipennaria Fuchs. Size and shape of *ochrofasciata*, but nearly uniformly ochre-yellow, with fine and regular brown strigulation, discal rings not very strong; the lines at costa of forewing light-bordered on reverse sides, the postmedian line broken into dots, on the hindwing connected by a dark proximal shade. Underside yellowish grey, irrorated, the forewing with light curved stripe, the distal area darkened by stronger dusting. Koko-Nor and Amdo.

variegata.

G. variegata Dup. (= *mucidata* Tr., nec Hbn.) (22 f). A pretty species with its mixture of bright ochreous and blue-grey on the upper surface, the scaling in part laid on in very fine transverse striation, as in some species of *Glossotrophia*. The under surface is also characteristic, being somewhat analogous to that of *glaucinarina* but with the dark border much broader or when (as frequently happens) it is narrowed it is the proximal part that chiefly remains, more or less broken in the middle. In the name-type the blue-grey admixture is comparatively slight. — In ab. **cymbalaria** Mill. (= *corneliaria* Mill.) the blue-grey becomes predominant, though a slight ochreous admixture remains in the median area, at least as an edging to the lines. — **corsica** Mill. is much darkened, at least in the distal area, which is almost fuscous. Said to be constant in Corsica. — Larva very rough, with strong transverse folds, the tubercles prominent, pointed, the 2nd, 3rd, 4th and 5th abdominal segments with dorsal humps; yellowish grey, with angulated dark dorsal markings. On *Asplenium ruta muraria*, hibernating. In captivity it will accept various low plants. Distributed in Southern Central Europe, Asia Minor, Syria.

lineolaria.

G. lineolaria Püng. Similar to *variegata* but larger, with more elongate, more pointed forewing and especially distinct structurally in having more strongly developed, upcurved palpi. Reddish grey, except in a few places densely marked with fine black lines, and with the normal markings; subterminal line only indicated at the costal margin. Underside somewhat glossy, yellowish, without cell-spots, distal dark band very broad with lighter patches in the middle and on the forewing with light apex. Central Asia: Alexander Mountains.

lenticiliata.

G. lenticiliata Chr. (25 d). Smaller than the adjacent species, forewing narrower, hindwing less crenulate; the markings show a similar transversely striated arrangement. The yellowish ground-colour is strongly overspread with blue-grey shading, leaving only clearer bands in the neighbourhood of the blackish lines and ocellated cell-spots; fringes yellowish, gradually becoming light grey distally. Underside pale yellowish with black-grey cell-spots and submarginal band, the forewing also with some dark shading in the cell. Transcaspia. — **subvariegata** Stgr. is predominantly ochreous, only "some scattered strigulation remaining grey;" underside much less sharply marked. Palestine.

annubilata.

G. annubilata Chr. (25 d). Size of a small *mucidaria* and similar in shape. Antenna of ♂ probably not pectinate (CHRISTOPH says „less ciliated“). Ground-colour light yellow grey, but stronger darkened with small black-brown transverse strigulae, towards the distal margin particularly dark. Antemedian line broad, curved outwards, postmedian angled obtusely near the costal margin, then somewhat oblique, slightly dentate outwards; discal marks very pronounced. Underside nearly similar to that of *mucidaria*, the hindwing lacking the broad dentate band. Transcaucasia.

mucidaria.

G. mucidaria Hbn. (22 e). Extremely like *variegata*, but the ♂ antennae with very short pectinations, while that of *variegata* has merely strongly projecting joints. A puzzling intermediate occurs in Corsica. Generally distinguished further by its rather less rounded forewing, less blackened costal spots, median area rarely grey at costa, underside less sharply marked. A variable species both in size and colouring. The name-type

has a fleshy-ochreous ground, with grey lines and spots. — *grisearia* Stgr. is said to be predominantly grey, but *grisearia*. STAUDINGER quotes GUENÉE's var. A, which is pale ochreous with the grey almost confined to a subterminal shade. S. France and Andalusia. — *subsignaria* Stgr. is a more unicolorous greyish form, with unmarked *subsignaria*. underside. Sicily and S. France. — ab. *herrichii* Ob. has also a somewhat greyish tone but with very sharp *herrichii*. markings, some ochreous admixture remaining in the median and terminal areas. STAUDINGER includes it in his confused var. *grisearia*. — *lusitana* Mendes is the darkest known form, densely irrorated almost throughout *lusitana*. with blackish, only in the median and terminal areas with slight brownish tone. Portugal. — *ochracearia* Stgr. *ochracearia*. is deeper ochreous, inclining to reddish ochreous, with comparatively slight grey admixture. Murcia and frequent in S. Algeria. — Larva very similar to that of *variegata* but with the dorsal humps ending in double points. On low plants. The moth double-brooded, distributed in S. Europe and Algeria.

G. dubitaria Stgr. differs in its colour, which is very light clay-colour or brownish grey-white, with light *dubitaria*. wood-brown markings, partly marked with extremely fine black strigulation, as in *variegata*, and in its sharply marked underside, which is also as in *variegata*; but the antennal pectinations are at least as long as in *mucidaria*. Mesopotamia and N. Persia. — *gracaria* Stgr., from Greece, is more mixed with grey on the upperside *gracaria*. beneath quite as in the name-type. — Perhaps *dubitaria* is nothing more than an eastern race of *mucidaria*.

G. evanidaria Püng. is an insignificant species, dirty grey-brownish with indistinct grey markings, *evanidaria*. underside whitish, sometimes with discal spots indicated, otherwise unmarked. Probably related to *mucidaria*, shaped more like *mutilata*, distinguished by its weaker build, very slender, finely ciliated antenna and by the underside. Aksu district, Chinese-Turkestan.

G. tholeraria Püng. Size of the preceding (i. e. of a large *mucidaria*), more yellowish, more coarsely *tholeraria*. irrorated, markings more distinct, distal margin with dark dots between the veins, a proximally dark-shaded subterminal line present, forewing less elongate, underside yellowish, discal spots and postmedian line distinct, dark antemarginal shades, ♂ antenna somewhat thicker, but only extremely shortly ciliated. With the preceding.

G. exsuctaria Püng. is very similar to *evanidaria*, but is larger, the forewing less narrow and pointed; *exsuctaria*. both are slenderly built. Forewing moderately broad with apex rounded, distal margin slightly undulate, oblique; grey and ferruginous, irregularly clouded; antemedian line and discal ring rather indistinct, postmedian shortly dentate, right-angled on 1st radial. Hindwing weakly crenulate. Underside yellowish grey, mixed with lighter, distal part yellower, irregularly limited, forewing with cell-spot. Issyk-kul.

G. minutaria Leech (= *ephyrinaria* Ob.) (22 f) is distinct from all the forewing in its *Cosymbia*-like *minutaria*. appearance, the large white, black-ringed discal spots standing out sharply on the more or less darkened median area. The ♂ is smaller and darker-marked than the ♀. Underside grey, with curved postmedian line followed by a distally ill-defined paler band. W. China. Near *albistellaria* Warr. from India, which is rather smaller and much darker.

G. cinerea Btlr. (22 f) may perhaps be placed here but is very anomalous, the neuration, except in the *cinerea*. absence of the 2nd radial of the hindwing, being entirely that of an *Acidalia*, to which also its minute size and smooth face approximate it. Easily known by the yellowish centre of the discal spots and indistinct yellowish lines. Dharmasala to Sikkim. — *lilliputata* Pouj. is probably a form of the same, perhaps even a synonym. *lilliputata*. The lines and cell-spot are described as olivaceous and perhaps it is on the whole more weakly marked but the figures are unrecognizable and my only example is too worn to allow of characterization. W. China: Mou-pin and Omei-shan.

G. dolosaria H.-Sch. (22 f) is a small and insignificant species which would perhaps be better trans- *dolosaria*. ferred to *Rhoptria*. Dull brown-grey with small black discal dots, the ordinary lines best marked on the veins. Distal margin of hindwing only weakly undulate. Underside scarcely lighter, weakly marked. Crete, Greece, Macedonia and Western Asia Minor.

G. tibiaria Rbr. (22 f). Rather larger, wings relatively longer, distal margin of hindwing almost smooth, *tibiaria*. with an inappreciable sinuosity in the middle (thus nearer to Section D in shape). Brown, the forewing with dark dusting, the hindwing with a fairly distinct discal dot. Underside rather lighter, both wings with discal dot and postmedian line of dots better indicated. ♀ abdomen robust. Only recorded from S. W. France.

G. benesignata Bell. (25 d). Size and shape of *tibiaria*, forewing more fuscous, much more sharply *benesignata*. marked, the pale transverse lines being indicated and a series of black vein-streaks appearing in the median area (the anterior ones confined to its distal part); hindwing with a strong postmedian line of black dots. According to RAMBUR the antenna differs, being more strongly crenulate, but MABILLE bred similar examples among *tibiaria*. Corsica. Unknown to me.

- poggearia*. **G. poggearia** Led. (22 f). Larger than *dolosaria*, similarly coloured but somewhat more variegated. Forewing with apex more acute, hindwing rather more undulate; discal dot of forewing larger, postmedian line usually faintly brown, but chiefly indicated by small blackish vein-dots. Underside much more coarsely dusted than upper. Syria and the Taurus.
- palaestinensis*. **G. palaestinensis** Calberla (22 f). Forewing in ♂ with fovea. Pale straw yellow, densely irrorated with brown; discal spots present on both wings, on the hindwing indistinct; lines brown, the antemedian gently curved, indistinct, median shade thick (sometimes obsolete), postmedian midway between this and distal margin, angulated on the 1st radial, not toothed on the other veins, present (except in costal area) on the hindwing. Underside yellowish, with the discal marks distinct, that of the forewing large and round, that of the hindwing narrow and elongate, a brown postmedian stripe also present, on the forewing not reaching the hindmargin. This stripe distinguishes *palaestinensis* from *gruneraria*. Palestine.
- gruneraria*. **G. gruneraria** Stgr. (25 d). Near *poggearia* but larger (size of *serotinaria*), both wings with broad chocolate-coloured, not black-dotted postmedian line. Further differs in its much lighter, dirty yellow underside. Greece: Taygetos, Veluchi.
- lentiginosaria*. **G. lentiginosaria** Leech (22 g) is a species quite apart, the broad white wings strongly spotted and clouded with fuscous, the cell-spots large but not ocellated. W. China.
- myrtillata*. **G. myrtillata** Thnbg. (= *canaria* Hbn., *limosaria* Esp.) (22 g). A variable species, frequently of very large size, the ♀, however, considerably smaller than the ♂. I know of no species with which it is likely to be confused. The name-type is a dark fuscous-grey form which prevails in Scotland, Scandinavia, Russia, the Caucasus and Altai, etc. — ab. **anastomosis** Strand has the markings very sharply black, the antemedian and postmedian lines of the forewing anastomosing behind the middle, then separating again. — **obfuscaria** Hbn. is a cinereous form from the Pyrenees, the mountains of Italy, etc. In the Alps both forms occur. — *nivea*. **nivea** Schawerda is a large whitish mountain form from Herzegovina. — Egg roundish oval, laid with its micropyla uppermost; reddish purple, brightest at the micropylar end, ribbed longitudinally and crossed by numerous rings of transverse ribs. Larva stout, cylindrical, rugose, the 8th abdominal with a pair of small dorsal points; greenish brown or more greyish. On low plants, hibernating. Imago in July, common in many localities.
- sericaria*. **G. sericaria** Alph. (22 g) resembles *myrtillata* but has the distal margins much more crenulate, the apex of the forewing more acute, the wings less opaque, whitish-grey, strongly irrorated, the postmedian line removed further from the discal dots, which are smaller. Thian-Shan.
- C. Distal margin of hindwing undulate. Antenna in ♂ bipectinate. (*Lataescia* Hbn.; type *dilucidaria*, Hmps. et Warr. usus, mea sel.)
- sacrararia*. **G. sacrararia** Stgr. Much smaller than the European species of this group, palpus exceptionally small. Variable in colour, grey to grey-brown, finely and densely irrorated with dark scales. Forewing with indistinct traces of antemedian line, small but distinct round cell-spot (mostly weakly pale-centred), postmedian line consisting of dots. Hindwing with the cell-spot usually weak or obsolescent, postmedian line as on forewing. Underside lighter, in the ♀ white, almost unmarked except that the forewing sometimes shows the cell-spot distinctly and occasionally a dark postmedian line is present. Palestine, October—November.
- adjectaria*. **G. adjectaria** Stgr. resembles *luteiciliata subvariegata*, but is distinguished at once by the pectinate ♂ antenna. ♂ about 22—24 mm in expanse, dull brownish, the discal ring and postmedian line not very strong, sometimes almost obsolete, hindwing with basal half lighter (dirty white-grey), distal half darker clouded. Underside dirty white-grey, quite weakly marked. ♀ larger and lighter. Palestine, November.
- serotinaria*. **G. serotinaria** Schiff. (22 g). Less variable than some of the species, generally distinguishable from the two following by its yellowish tone, with brown irroration, lines, and shading before the subterminal (especially at hindmargin). Antemedian line bent outwards in and again behind the cell, thickened at costa and on the veins (in *sordaria* and *dilucidaria* nearly straight); postmedian generally rather thick, always with marked teeth or dashes on the veins; discal rings large. Forewing beneath more strongly dusted but never unicolorous smoky, both wings with cell-spot and traces (sometimes distinct) of postmedian line. Hindtibia of ♂ dilated.
- tenebraria*. — ab. **tenebraria** F. Wagner (= *dognini* Th.-Mieg, *aenearia* Ob.) is very much more densely dusted (sometimes almost entirely covered) with dark brown. Rather prevalent in the Pyrenées Orientales. — Larva cylindrical, the abdominal tubercles conspicuous, the 8th abdominal with 2 short dorsal points; greenish yellow, with triangular brown dorsal spots. On low plants, hibernating. Moth in July, distributed in the Alps, also in the Pyrenées Orientales. According to KRULIKOVSKY, the white form from the Ural which has been recorded as *serotinaria* is different in shape, etc., and cannot belong here.

G. sordaria is a variable species, less yellow than *serotinararia*, generally more brownish-tinged and less strongly glossy than *dilucidaria*, the ♂ antennal pectinations rather shorter, hindtibia not dilated, the lines commonly with coarser dark dots or short dashes on the veins, postmedian of forewing acutely dentate at 1st radial. Forewing beneath usually somewhat infuscated but never of the uniform glossy dark smoke-colour of *dilucidaria*. — **sordaria** *Thnbg.* is a rather small, in general weakly marked form, the lines more or less broken into vein-dots. It inhabits Scandinavia and Finland. — ab. **distincta** *Strand* has the lines black and uninterrupted, the postmedian rather well expressed on the underside. — ab. **strandata** *Fuchs* is much more densely irrorated, the lines almost or quite effaced. — Egg oval, brown-red, with strong longitudinal and slight transverse ribs, near the micropyle of more equal strength and with knots at the angles. Larva stout, grey-yellowish, with not very prominently darker dorsal pattern. — **mendicaria** *H.-Sch.* (= *dilucidaria* *Frr.*) (22 g). Considerably larger (generally surpassing *dilucidaria*), darker both above and (especially on the forewing) beneath, the markings generally as in ab. *distincta*. Face black. — ab. **radiata** *Hirschke* has the marginal dots prolonged into conspicuous longitudinal dashes. — Larva (probably not different from that of *sordaria*) similar to that of *serotinararia* but with longer dorsal points, darker dorsal line, etc. This race inhabits the Alps, the mountains of Silesia and Hungary, etc., July.

G. dilucidaria *Schiff.* (= ? *myopata* *F.*) (22 g). Generally more glossy, silvery whitish or very light grey, easily known by its white face; the almost uniform, glossy dark smoke-colour of the forewing beneath (with pale line beyond the middle) is also characteristic. Moderately variable, the band proximally to the subterminal line often strongly developed. Hindtibia of ♂ dilated. — ab. **epicearia** *Peyer* is said to be rather larger, more tinged with reddish (? brownish), the subterminal dark band wanting. Alsace. — ab. **brunnea** *Vorbr. u. Müll.-Rutz* is perhaps similar. „A duller, darker, more strongly brown form with sharper markings.“ Switzerland. — ab. **interrupta** *Hirschke* has the median area narrow and irregularly broken, the postmedian line placed close to the discal ring, bent along the 3rd radial vein. — Egg oval, with small, not strong hexagonal cells arranged in longitudinal rows; light yellow when laid, changing through orange to carmine. Larva short and thick, distinctly carinated laterally and with small dorsal prominences on the 8th and 9th abdominals; yellowish or reddish grey, with fine, interrupted brown lines and light yellow lateral stripe. On low plants, hibernating. Flies in July and August; common and pretty generally distributed in the mountains of Central Europe, also recorded from the Ural and a variety from Issyk-kul.

G. sproengertsi *Püng.* superficially resembles a small *dilucidaria* but has the ♂ antennal pectinations of *caelibaria*, hindwing little more undulate than in that group, but the sexes alike. Underside with dark distal border, preceded by a narrow pale band. Alpes Maritimes: St. Martin-Vésubie, in July.

D. Distal margins almost smooth. Antenna in ♂ bipectinate. ♀ partly or altogether apterous (*Elophos* *Bsd.*).

G. iveni *Ersch.* (22 h). The ♂ differs from those of the other species of the section in its longer, narrower wings, rather deeper sinus between the radials of the hindwing and longer antennal pectinations. The name-type is dark grey. ♀ apterous, not further described. Ferghana and Ili district. — ab. **perruptata** *Fuchs* has a black, proximally dentate distal stripe on both wings. — **clarior** *Stgr.* is a much lighter, more yellowish grey form from Samarkand. — **gilvaria** *Stgr.* is very likely a separate species, as the wings appear to be somewhat broader and the pectinations somewhat longer. Straw-yellow or sand-yellow, sprinkled rather thickly with distinct dark strigulae. Central Asia, exact locality not recorded.

G. zelleraria *Frr.* (22 h). ♂ slenderly built, rather glossy, weakly marked, very easy to recognize by the underside, which is pale with a strong though narrow dark band close to the distal margin. ♀ with robust body and short, rounded wings, unfitted for flight but much less aborted than in most of the other species of the section, beneath marked as in the ♂. Local in the higher Alps and to Herzegovina. — **occidentalis** *Ob.* is a very pale, weakly marked western race, with the band beneath usually narrowed, sometimes quite feeble. France and Asturias. — Larva stumpy, greenish grey, with white-yellow subdorsal and lateral stripes. On low plants. Moth in July—August.

G. unicoloraria *Rbr.* (25 l) is perhaps an extreme form of *zelleraria occidentalis*, which name it would supplant. Subdiaphanous grey, the markings obsolete except a postmedian line, on forewing angled at 3rd radial. No trace of the dark border beneath. Andalusia(?)

G. andereggaria *Lah.* (22 h). Near *zelleraria* but rather darker grey, much mottled with whitish, the veins in the ♂ more strongly yellow, underside without dark marginal band, antennal pectinations somewhat longer. ♀ with rather smaller, narrower wings than *zelleraria*, the forewing more pointed. — ab. **mauricauda** *Ob.*, from Styria, is much darker, almost uniform fuscous above and beneath. — Valais, Piedmont, Styria and S. France, very local and scarce, July—August.

- caelibaria*. **G. caelibaria** H.-Sch. (25 i). Essentially smaller than the two preceding, the ♂ antenna with very short, clubbed pectinations, the ♀ wings reduced to mere vestiges, the forewing not quite as long as the body, ending in a point. Very variable. The name-type is a small, light, bluish ash-grey form, rather weakly marked.
- senilaria*. It inhabits the mountains of Austria, Piedmont, etc. — **senilaria** Fuchs is still smaller, lighter, the lines rudimentary or wanting. Bavarian Alps, Styria, etc. — **jugicolaria** Fuchs agrees with the preceding in the lack of the lines but is of a strongly yellow tone. Stilfser Joch. Perhaps an aberration of *spurcaria*. — **zirbitzensis** Pieszcsek (22 g) is another very small form, but is much darker, copiously dusted with black-grey, the lines strong, blackish. N. Styria: Zirbitzkugel. — **spurcaria** Lah. (= *scalettaria* Mill.) (22 h) is larger than the name-type, more variegated, recalling the colouring of *andereggaria*. Switzerland, Bavaria, etc. Also recorded from the Ala Tau. — Larva stout, rough, with interrupted reddish dorsal stripe and yellowish lateral stripe. On low plants, hibernating. Imago in July.
- operaria*. **G. operaria** Hbn. (= *nitelaria* Esp.) (22 h). On an average rather larger than *caelibaria*, antennal pectinations almost as short, but scarcely clubbed, ♀ with paler, still more vestigial wings. Postmedian line of forewing more sharply angulated on the 1st radial, commonly with stronger teeth on the veins. Distal margin with a row of dark dots, which are wanting in *caelibaria*. The name-type is coloured nearly like that of *caelibaria*, or slightly more brownish-tinged. Austrian Alps, Silesia and Northern Carpathians. — **hoefneri** Rbl. is larger, more strongly marked and much more mixed with yellowish (coloration of *andereggaria*). N. Styria: Zirbitzkugel. — Egg oval, shagreened, flesh-colour. Larva short and stout, reddish yellow with blackish subdorsal stripe and dark edging above the light lateral stripe. On low plants. The moth flies in July.

E. ♂ unknown.

- thibetaria*. **G. thibetaria** Ob. (22 i). it is very doubtful whether this species, founded on a single ♀ from Ta-chien-lu, is even referable to *Gnophos*. The figure suggests some possible affinity with *Micrabraxas pongaria* Ob. (22 h). It should be recognizable by the mottled white and grey forewing with dark central shade and olivaceous (or, in the description, „fulvous“) antemedian and postmedian lines or bars, the almost unmarked hindwing, etc. Forewing beneath glossy grey with 2 pale lines or bars, hindwing less glossy, paler, a slight postmedian line marked with distinct dark dashes on the veins.

138. Genus: **Orphne** Hbn.

Related to *Gnophos*, Section D, differing chiefly in the hairy face and shaggily haired palpus. Forewing in ♂ with costal margin somewhat concave in the middle, ♀ wings shortened and rounded, nearly as in *Gnophos zelleraria*. Only 2 or 3 species known.

- P. tenebraria** is locally variable, especially on the under surface. The upper is always very dark and weakly marked, although the black discal dots seem to be always present. The name-typical form **tenebraria** Esp. (= *torvaria* Hbn., *horridaria* Hbn. nec Schiff., *olivacea* Warr.) (23 b) shows a decided tinge of brownish and has the lines discernible on the upperside or at least their position indicated by vague pale shading on their reverse sides. The under surface shows a whitish submarginal band in varying intensity, sometimes clear white. Alps and Apennines, only at high altitudes. WARREN's type of *olivacea* was said to be from Spiti, N. W. India, probably in error. — **wockearia** Stgr. is an extreme underside development, the white submarginal band very sharply expressed, slender, in addition with an apical patch on the forewing white. S. Tyrol. — **septaria** Guen. Upperside uniform dark leaden grey, not brownish, underside with the pale bands obsolescent or entirely wanting. Pyrenees, from about 3000 m. — **innuptaria** H.-Sch. (23 b) differs little from *septaria*, but is not quite so dark, not entirely free from a slight brownish tinge, extremely glossy, the underside almost entirely unicolorous. Styria and Carinthia. — Egg oval, granulated, light brown. Larva short and stout, smooth, dull greenish with indistinct light lateral stripe. On low plants. The moth appears in July and August.

139. Genus: **Psodos** Tr.

Face and palpus with long projecting hairs. Antenna in ♂ simple. Breast and femora hairy. Forewing with the 1st and 2nd subcostal veins frequently coincident. Hindwing with costal margin relatively long, distal margin smooth.

A small genus of closely allied Palearctic (mostly European) species, all inhabiting the high mountains, where they fly in the sunshine. All are of small size and, with the exception of the type species *quadri-faria*, of very uniform aspect.

- P. alticolaria** Mann (23 b) is recognizable on the upperside by the well-expressed, curved, not appreciably dentate lines, but is especially characteristic beneath, the thick, curved postmedian dark line being followed by two conspicuous white distal bands, the outer of them almost touching the margin except at the apex. The name-type is the largest, most brownish form. It inhabits the highest Alps and other great altitudes in

Austria, Piedmont, etc. — **faucium** *Favre* (= *frigidata* *Vorbr. u. Müll.-Rutz*), from Valais, is smaller and rather darker, the postmedian line more dentate, the white bands more slender. Perhaps a separate species. — **gedrensis** *Rondou* is still darker, in certain lights with more of a leaden or bluish tinge, the pale markings not very sharp, at least above. Pyrenees, at 2800—3000 m. elevation, flying in late July and August. Only a slight modification of *faucium*.

P. alpinata *Scop.* (= *horridaria* *Schiff.*, *carbonata* *Schr.*) (23 c). The most obscurely marked species of the genus, the lines and discal dot above faintly indicated, with very slight pale shading distally to the postmedian, the underside uniform blackish. Egg long oval, glossy, with hexagonal reticulation; yellow, soon becoming brown, or according to H. FISCHER covered with blood-red spots. Larva undescribed. Pyrenees, Alps, Carpathians, etc., June—July. A variety said to occur in the Sajan mountains.

P. noricana *Wagner* (23 c). Rather larger, less brownish tinged, the lines slightly better expressed, more dentate, the underside with the distal area slightly paler than the rest, more as in *coracina*. — Egg long oval, yellow-green, becoming bronzy brown. Larva similar to that of *coracina*, in its earliest stages much more brightly coloured; greyish yellow with dark dorsal line, thick black oblique subdorsal streaks and bluish white lateral stripe. Local in the Alps of Lower Austria, Styria and the Tyrol, flying in July.

P. spitzi *Rbl.* resembles on the upperside very dark, very sharply marked *coracina* but with a yellowish brown costal spot distally to the postmedian line of the forewing; under surface, on the contrary, confusingly like that of *alticolaria*. Carniola: Triglav, at an elevation of 2400 m., taken at the end of July among *coracina*; Carinthia: Karawanken. Possibly a form of *coracina*.

P. coracina *Esp.* (= *chaonaria* *Frr.*, *trepidata* *Dup.* in err.) (23 c). Somewhat variable in colour but always smooth-scaled, strongly glossy, with a silvery admixture and without the greenish tinge of the following species; lines similarly dentate. Underside with strong cell-spots and curved postmedian line, the distal area more or less markedly paler. ♀ lighter than ♂. — ab. **wahlbergi** *Lampa* (= *argentea* *Sp. Schneid.*, *argentea* *Hirschke*) has the ground-colour, especially of the forewing, predominantly silver-white, with only very slight dark dusting, the cell-spot and 2 lines standing out very sharply, usually also some spots proximally to the subterminal. Commonest in the ♀. Egg very similar to that of *noricana*. Larva light brown, similarly marked to that of *noricana*. Moth in July, Scotland, Scandinavia, the Pyrenees, Alps, Carpathians, etc.

P. canaliculata *Hochenw.* (= *trepidaria* *Hbn.*) (23 c). Closely similar to the preceding but less strongly glossy, on account of a strong, fine irroration, ground-colour with a distinct greenish tone and admixture of rust-yellow scales. ♀ often less narrow-winged than in *coracina*. Rather variable, dark specimens more prevalent than the paler, more silvery-mixed ones. — Egg relatively large, oval, smooth. Larva violet-brown, finely shagreened with white, sides blackish grey, dorsal line very indistinct except on thorax, segment-incisions with pairs of anteriorly converging dashes on a yellow ground. Pupa smooth, glossy yellow-brown, anal end in ♂ finely pointed, darker. Moth in July. Pyrenees, Alps, Carpathians, Bosnia and Herzegovina.

P. bentelii *Rätzer* is a little-known species, related to *canaliculata*. ♂ considerably larger, dark slate-grey, almost blackish, sometimes without the green irroration of *canaliculata*; postmedian line of forewing almost parallel with distal margin, meeting the line of the hindwing; cell-spot of forewing nearer the postmedian line; underside with very distinct, dark median area, its distal edge very strongly curved at costa. ♀ considerably more sharply marked, especially on the underside. Local in Southern Switzerland, July—August.

P. altissimaria *Ob.* is only known to me from the figure and description. Blackish brown with scattered yellowish scales, discal spots present, the lines sinuous, the pale subterminal line lunulate, on the hindwing with a band before the middle quite different from that of any of the other species. The underside somewhat recalls that of *gnophosaria*, which I have referred to *Gnophos*, but is darker, with uninterrupted dark band proximally to the subterminal line of the hindwing, etc. From the high mountains of E. Tibet, without more exact locality.

P. quadrifaria *Sulz.* (= *alpinata* *Schiff.* nec *Scop.*, *equestrata* *Bkh.*) (23 c) is distinguished at once by the yellow band on each wing, above and beneath. The name-type is rather small, brownish, the bands on the whole broad. — ab. **stenotaenia** *Schwingenschuss* has the bands greatly narrowed. Glockner. — **pyrenaea** *Ob.*, the Pyrenean race, is on an average larger, blacker, the bands on an average slightly narrow, though less so than in *stenotaenia*. — An aberration (?) with the yellow bands much dusted with dark scales has been mentioned as a possible hybrid with *alpinata* (MÜLLER-RUTZ). — Larva brownish, with dark dorsal line, oblique subdorsal streaks and yellowish lateral area. On low plants. Moth in June and July, Alps and Carpathians, etc.

140. Genus: **Songarica** *Gmpbg.*

Structural characters unknown, as GUMPPENBERG merely founds his genera on the wing-shape and I am not acquainted with the species. „Costal margin arched, distal margin flexuous, all the angles distinct.“ Antenna filiform, but the sex of the example is not indicated.

mollicularia.

S. mollicularia *Ev.* About the size of *Cosymbia punctaria*. Uniform, soft greyish fawn-colour, without dark shadings, only a rather broad median area (rather more than one-third the wing-length) slightly darker, bounded by fine whitish, very finely crenulate lines, which run parallel with the distal margin except near the costa, where they are curved proximally; a fine whitish subbasal line also present. Hindwing with the postmedian line continued, curved parallel to the distal margin. Underside without markings, ground-colour nearly as above. Noor-Zaisan.

141. Genus: **Pygmaena** *Bsd.*

Differs from *Psodos* in the more slender, narrower wings, those of the ♀ extremely narrow (unfitted for flight), ♂ antenna with short pectinations, forewing in the ♂ with a fovea. Only one species.

fusca.

P. fusca *Thnbg.* (= *venetaria* *Hbn.*, *canitiaria* *Frr.*) (23 d). ♂ dirty brown-grey to black-grey, ♀ rather lighter, both wings with black discal dot, forewing also with 2 lines which vary much in distinctness. — ab.

unistrigata.
destrigata.

unistrigata *Strand* lacks the antemedian line. — In ab. **destrigata** *Strand* both lines are wanting. — Larva short, thick, with transverse skin-folds; dark reddish brown, with black, yellow-edged dorsal stripe and yellow lateral stripe. On low plants, hibernating. Scandinavia, Finland and the highest Alps.

142. Genus: **Ithysia** *Hbn.*

Face with rough projecting hairs. Palpus rather short, rough-scaled. Tongue short. Antenna in ♂ bipectinate to apex, with short branches. Pectus hairy. Legs slightly (the ♂ femora more strongly) hairy. Wings of ♂ long and narrow, forewing pointed, 1st subcostal anastomosing or connected with costal, 2nd free. Only one species, no doubt related to the *Nyssia* group.

pravata.

I. pravata *Hbn.* (23 d). ♂ quite unmistakable on account of the curved white band of the forewing from the base to near the apex and the white veins. ♀ light grey to yellowish, more yellow at the segment-incisions, the thorax dorsally brown. — Larva smooth, nearly cylindrical, pale yellowish much dotted with red-brown, dorsal line fine, double, extremely ill-defined, subdorsal and lateral lines and an intermediate one pale, continuous, finely edged with red-brown, dorsal area somewhat darker, traversed by similar fine lines (from a preserved larva in the British Museum). Sarepta, common in May.

homochromata.

Liodes homochromata *Mab.* (25 h) as *homogrammata*), placed by STAUDINGER between *Ithysia* and *Narraga*, is probably not determinable until the structure can be examined, although MABILLE gives a good figure. Small, wings not very broad, rather recalling a narrow-winged *Dichromodes*, an appreciable bend at the extremity of the 3rd radial of the hindwing. Antenna bipectinate. Forewing uniform shining blackish grey with some iridescent yellowish scales. Fringe and hindwing paler. Underside similar, costa of forewing suffused with fulvous. Corsica: Bastia, a single ♂ believed to have been bred from *Gerista corsica*.

143. Genus: **Atomorpha** *Stgr.*

Face rounded. Palpus short. Antenna in ♂ ciliated. Body relatively robust. Foretibia extremely short, furnished with one or two terminal claws. Wings somewhat broader than in *Narraga*, distal margins smooth. Forewing with cell rather long, 1st—2nd subcostal coincident, connected by a bar with 3rd—4th. Hindwing with costal closely approximated to cell for some distance, sometimes anastomosing, 2nd subcostal sometimes shortly stalked with 1st radial, 2nd radial wanting.

An interesting little genus, recalling *Lithostege* except in the neuriation, but connected with the following through the American *Fernaldella*, which has the foretibial claw but is otherwise almost a *Narraga*. All the species are Palearctic. I have seen very little material and do not know the type species *falsaria*. The genus was described by ALPHÉRAKY under the preoccupied name of *Atomophora* which STAUDINGER (probably by oversight) changed to *Atomorpha*; the change was accepted by ALPHÉRAKY and is here maintained.

falsaria.

A. falsaria *Alph.* Rather longer-winged (more *Narraga*-like) than the following, greyish white, coarsely dusted with brown, the large cell-spot and 2 lines formed by agglomerations of the brown scales; antemedian line broad, straight, vertical, postmedian still broader, forming a sinuous band from costa about 2 mm. before the apex to hindmargin adjoining the anal angle. Hindwing regularly but in general rather less densely irro-

rated. Underside similar, but with the bands paler. Foretibia with a single claw. Hindwing with costal not anastomosing, 2nd subcostal not stalked. Tarsi not described. Kan-su at the end of June.

A. hedemanni Chr. (25 h). Broader winged, 1st line bent inwards behind the subcostal vein, distal area with some large brown blotches. Hindwing with large vague cell-spot and strong distal cloudings. Fringes strongly chequered. Underside similar, hindwing less infuscated. Fore-tibia with 2 claws. Hindwing with costal anastomosing, 2nd subcostal stalked. Transcaspia. — **mabillearia** D. Luc. (= *marmorata* B.-Haas) is probably nothing more than a local form of the preceding, agreeing entirely in shape and structure, but lighter, especially the hindwing, which has not the fringe chequered. Said, however, to be very variable. — ab. **alba** D. Luc. lacks the distal blotches of *mabillearia*. Both these forms inhabit Tunis. I find that „*Lithostege marmorata*“ mentioned on p. 175 as unknown to me in nature, is nothing but a synonym of the present species and must there be entirely deleted.

A. punctistrigaria Chr. is unknown to me. Forewing whitish, more or less irrorated with fuscous, with 3 rows of fuscous spots and a short apical dash. Hindwing greyish, distally infuscated, inner margin with 2 fuscous spots. Askhabad.

144. Genus: **Narraga** Walk.

Face with appressed scales. Palpus with long projecting hairs. Tongue weak. Antennæ of ♂ bipectinate to apex. Foretibia without claw. Wings narrow, erected in repose. Forewing with 1st—2nd subcostal coincident, anastomosing or connected with costal and with 3rd—4th subcostal. Hindwing with costal anastomosing with subcostal (in *nelvae* closely approximated), 2nd subcostal stalked with 1st radial. Only 2 species yet known.

N. fasciolaria Hufn. (= *cebraria* Hbn., *zebraria* Dup.) (23 d). Very variable but easily known by its shape, structure, the light, dark-spotted fringes and varied underside. The latter is generally yellow brown with rather darker bands and with white spots, those of the forewing confined to the costa and hindmargin (that at apex purest white), the hindwing in addition with a distal row and elongate ones in the cell and along the radial fold. The name-typical form (though varying) is local in Central and S. Europe, Asia Minor, Central Asia and according to STAUDINGER Amurland and N. China. — **tessularia** Metzner (= *baltearia* Frr., *atro-macularia* H.-Sch.) (23 d) is smaller, whiter, with sharply blackish bands. Ural and as an aberration (?) in S. Hungary and Transcaucasia. — **fumipennis** subsp. nov. is rather small and narrow-winged, upper surface uniform smoke-colour, only the fringes normal, forewing beneath smoke-colour with yellow costal spots and apical band, the latter continuing (but narrowing) to just behind the 3rd radial, hindwing beneath yellow with indistinct dark bands, darkened where they pass between the elongate light spots of the cell and radial fold. Pekin in August, one only (a ♂) known to me, in coll. Brit. Mus. Perhaps a species, as the palpus appears shorter, but HERZ mentions Pekin specimens as agreeing with the darkest European; intermediate aberrations occur in Europe and ALPHERAKY mentions one from Kan-su. — Larva slender, smooth, green, with white lines, the dorsal finely dark-edged. On *Artemisia campestris*. The pupa hibernates and the moth is double brooded.

N. nelvae Rothsch. (23 d). Closely similar to *fasciolaria*, but easily separated by the broader wings and the neurulation. Algeria.

145. Genus: **Isturgia** Hbn.

Face with strongly projecting hairs or tuft. Palpus moderate, with long projecting hairs. Antenna in ♂ with short or quite moderate pectinations. Femora slightly or scarcely hairy. Forewing with fovea; 1st—2nd subcostal coincident, generally connected with costal by a short bar near their base (vestige of 1st subcostal?). — Larva of moderate proportions, nearly cylindrical, smooth. The moths fly in the sunshine and commonly rest with the wings closed over the back in the manner of butterflies. Occurs in the Palearctic and Nearctic Regions.

I. carbonaria Cl. (= *picearia* Hbn.-Gev., *atomaria* obsoletaria Stichel nec Zett.) (23 f). A pretty and distinct species, white with dense blackish dusting and narrow blackish bands, all angulated outwards in the middle. — ab. **roseidaria** Hbn. has less dark marking and the white ground mixed with yellowish. Prevalent in Lapland. — Larva convex above, carinated laterally, dingy brown, rather paler ventrally, a pale lateral stripe dark-edged above, a broad pale medio-ventral stripe. Has been reared on birch and willow, probably also eats low plants. The pupa hibernates. N. Europe, the Alps and the mountains of Silesia, flying in May and June.

cretacea. **I. cretacea** *Stgr.* Unknown to me, perhaps not congeneric. Shape of *carbonaria*, pectinations much shorter. Forewing dirty chalk white with fine olive-grey dusting and 3 ill-developed dark bands, the two outer approximated at hind-margin, diverging a little anteriorly, the distal running to the costa almost at apex; distal margin with large black lunate spots; fringe with dark dividing line. Hindwing grey-white, towards the distal margin somewhat darker. Transcaspia.

limbaria. **I. limbaria** *F.* (= *conspicuata* *Schiff.*, *auroraria* *Hbn.* part., *circumdataria* *Vill.*, *roraria* *Esp.* nec *F.*) (23 d, e). Ground-colour above always bright yellow, lines entirely obsolete; very variable in the extent and arrangement of the dark dusting. Underside of forewing without dark border, hindwing paler yellow, densely dusted so as to appear olivaceous or even fuscous, always with white or whitish streaks along the folds, or at least the radial one. The typical form has little dusting on the upperside of the forewing except along the costal margin, but has a very conspicuous black distal border. — ab. **quadripunctaria** *Fuchs* has in addition distinct black discal dots. — ab. **fumata** *Mathew* has the yellow ground-colour more tinged with smoky and both wings densely dusted with blackish throughout. — **delimbaria** *Stgr.* is a small race with the black border narrowed, wanting on the hindwing, underside lighter. Digne. — **pedemontaria** *Stgr.* is similar, but with the hindwing beneath almost unicolorous yellow. Piedmont and Alpes Maritimes. — **anzascaria** *Stgr.* is larger, paler at the margin, the wings ochraceous yellow, the black border either entirely wanting on both wings or with vestiges remaining on the forewing only. N. Piedmont: Val d'Anasca. — **rablensis** *Z.* has the ground-colour rather lighter than the type, more irrorated with black, the distal border in the ♀ dissolved into black irroration, though still denser than on the rest of the wing. Carniola and Carinthia; also from Macugnaga. — **styriaca** *Schwingenschuss* is somewhat smaller and narrower than *rablensis*, the ♂ more uniformly and densely irrorated and with less developed dark border, underside more whitish. Styria. — Larva green or brown, with light longitudinal lines and yellow lateral stripe. On broom. The pupa hibernates, the moth appearing in May, a second generation in July—August. Local in Central Europe.

roraria. **I. roraria** *F.* (= *adpersaria* *F.*, *auroraria* *Hbn.* part., *spartariaria* *Hbn.*, *conspicuaria* *Esp.*, *spartiaria* *Tr.*) (23 e). Very similar to *limbata rablensis* but with the irroration more regularly distributed on the forewing above and especially on both wings beneath; forewing above with broader distal border; hindwing beneath without a trace of white streaks. — ab. **aequestriga** *Hirschke* lacks the dark border of the upperside. Silesia. — Larva very similar to that of *limbaria*, green with pale longitudinal lines. On Genista and Spartium. The pupa hibernates. Moth in June—July. Local in Central Europe, especially eastward, also recorded from Transcaucasia.

146. Genus: **Bichroma** *Gmptg.*

Related to *Isturgia* but with more protuberant face and especially distinguished by the foretibia, which has a strong apical claw. Only one species.

famula. **B. famula** *Esp.* (= *concordaria* *Hbn.*) (23 e). A striking and very distinct species, perhaps least unlike some forms of *atomaria* ♂, but with stronger contrast between the colouring of the fore- and of the hindwing, larger cell-spot of the former, more slender lines of the latter, etc. Underside very prettily marked; forewing orange to beyond the postmedian line, then with a row of large black spots, then concolorous with hindwing; hindwing white, latticed with brown. — Larva elongate, green with brownish head, dark dorsal line and broad whitish-yellow lateral stripe. On broom. The pupa hibernates. Very local, Spain and Portugal to W. Germany, Berlin, Central Italy, April—July, two generations in southern localities.

147. Genus: **Fidonia** *Tr.*

Also related to *Isturgia* but with the palpus longer, tongue wanting, antennal pectinations much longer. Two species, inhabiting the Western Mediterranean countries. Probably LEDERER was justified in regarding them as genera.

A. Hairy clothing not more shaggy than in *Isturgia*. Forewing with 1st—2nd subcostal short-stalked (*Athroolopha* *Led.*).

pennigeraria. **F. pennigeraria** *Hbn.* (23 c). Recognizable at a glance by its large size and nearly uniform yellow hindwing, only with quite narrow dark borders. The underside in a measure reverses the pattern, the forewing being yellow with dark costal (and at times distal) margin and dark apex, the hindwing more mixed with fuscous, with a whitish postmedian band. Forewing above variable; in the name-type the white bands are more dentate and inclined to break up into spots, the antemedian band is almost V-shaped. Distributed in the Iberian Peninsula, S. W. France and N. Africa. — **chrysitaria** *Hbn.* (23 c) is on the whole darker, the forewing with distinct white stripes, the antemedian less acutely angulated in the cell and falling more perpendicularly on the hindwing; hindwing with costal margin longer and free from fuscous shading. Underside of forewing without dark discal mark, of hindwing very variable, its pale band straighter. Probably a separate species

Sicily, S. Andalusia and Central and S. Algeria. — ab. **nevadaria** *Ribbe* is a modification of *chrysitaria* without the dark border of the hindwing. — ab. **prieta** *Ribbe* has the hindwing above almost entirely darkened. — **kaby-laria** *Ob.* (23 e). Forewing mostly dark, antemedian and subterminal white lines nearly obsolete, postmedian very slender, though followed by some light dusting. Distal border of hindwing very dark, sometimes broadened. The dark parts of the underside similarly intensified, but the forewing without dark discal mark. Smaller than normal *chrysitaria*, both wings with distal margin more rounded towards the apex, but probably only a modification of that race (or species). Algeria: Collo and Philippeville; also from the Eastern Sahara. — The larva of *pennigeraria* has been described and figured by MILLIERE. Rather long, cylindrical, without projections, very dark vinous, dorsal line nearly black, slender on thorax, interrupted at the incisions on abdomen, subdorsal fine, light, also interrupted on the abdomen, lateral stripe white, very broad, undulate, marked by a fine black line above and large dots of the same colour below. On *Santolina chamae-cyparissus*, which according to RIBBE was refused by newly hatched larvae of *chrysitaria*. *Halimium occidentale* is also mentioned as a food-plant. Moth in May—June.

B. Hairy clothing (especially of face and palpus) very shaggy. Forewing with 1st—2nd subcostal coincident (*Fidonia*).

F. **plummistaria** *Vill.* (= *plumistaria* *Bkh.*) (23 e). Another striking species, variable but always unmistakable, quite different from the preceding in the black-banded wings, etc. ♀ narrower-winged, sometimes quite small. — ab. **auritaria** *Hbn.* is a remarkable aberration with the dark colour suffusing both wings throughout excepting some mostly small, scattered yellow spots, placed chiefly near the distal margin, on the forewing also in front of the 3rd radial. — ab. **confluens** *Ob.* Forewing black to the antemedian line and from the median to the subterminal. — ab. **albicans** *Ob.* Black markings greatly reduced. — ab. (?) **albesignata** *Neubgr.* from Portugal, is larger, the forewing white, not yellow, only the veins and distal margin remaining yellowish. — Egg somewhat cylindrical, with rounded ends, micropylar end narrow; longitudinal ribs distinct in the middle, transverse ribs less developed, white knobs at the angles. Larva less elongate than the preceding, equally smooth and cylindrical, yellowish brown, dorsal line broken into dark lozenges, subdorsal reddish, slender, uninterrupted, lateral stripe narrow, pale yellow, feebly undulate. On *Dorycnium*, easy to rear. Double brooded, the pupa hibernating, moth in March—April and less abundantly in September. S. W. Europe, N. Italy, Switzerland (Mont Salève) and N. Africa.

148. Genus: **Ematurga** *Led.*

Like *Isturgia* but the ♂ antenna with much longer pectinations, the fovea rudimentary. Probably a superfluous genus, yet the genitalia also seem to remove it from *Isturgia*, the latter showing the characters of *Macaria*. Only one species known, unless *iliaria* (unknown to me) be a second.

E. **atomaria** *L.* (= *isoscelata* *Scop.*, *pennata* *Scop.*, *aceraria* *Hufn.*, *artemisiaria* *Fuessl.*, *picta* *Geoff.*, *atomaria* *microcosma* *Geoff.*) (23 f). Very variable, the variation rather difficult to classify, being in large measure individual, in part racial and further complicated by marked sexual dimorphism. The name-type (♂) is yellowish with irroration and moderately distinct bands fuscous; the corresponding ♀ more whitish, the bands consequently sharper. — ♂-ab. **ochrearia** *Rbl.* entirely lacks the dark markings. — ♂-ab. **ustaria** *Fuchs* has the dark irroration much increased, in part confluent, leaving only scattered spots and dots of the yellow ground. — ♂-ab. **unicoloraria** *Stgr.* is uniform fuscous (in the N. English form nearly black), only the fringes showing lighter spots. A large form of *unicoloraria* possibly constitutes a local race in the Brusa district and N. Syria (Shar-Deresy). — ab. **obsoletaria** *Zett.* is a small dark form, with the bands broadened and more confluent. Especially in Lapland and Finland. — **orientaria** *Stgr.* (= *transalpinaria* *Frings*) (23 f) is freer from fuscous irroration, the bands narrowed or subobsolete, the dark border in the ♂ generally strong. In the ♂ a pretty and bright-form, chiefly characteristic of warm countries. Italy, Greece, Asia Minor etc. — **krassnojarscensis** *Fuchs* is described as smaller than the name-type, with narrower wings, the forewing more pointed, light grey-yellow with fine, dirty brown dusting, the distal area not darkened, the transverse stripes distinct. Krasnoiarsk, Siberia. — **meinhardi** *Krulik.* on the contrary, is larger than the name-type, the wings above and beneath ferruginous, not yellowish, the fuscous bands broader and more confluent. Semiretshje. — Larva without protuberances, very variable in colour and markings; brown, ochreous, grey or violet-grey with pale dorsal spots or lozenges. On *Calluna*, *Erica*, *Papilionaceae*, etc. The pupa hibernates. The moth is on the wing from April to June and there seems to be a partial second generation. Abundant in a great part of Europe, Central Asia and across Siberia. Amurland specimens are rather dull in colouring. — **iliaria** *Alph.* is probably, according to STAUDINGER, a separate species, smaller, much paler, the ♂♂ mostly almost unicolorous yellow, not dusted, or with very slight brown bands. Valley of the Ili.

149. Genus: **Bupalus** *Leech*.

Also nearly related to *Isturgia*, distinguished by the less projecting hairs on face, short palpus, plumose ♂ antenna and strong sexual dimorphism. The moths — or at least the ♂♂ — fly in the sunshine and rest (like some others of the group) with the wings closed together over the back. The genus is Palearctic only.

piniaria. **B. piniaria** *L.* (= *mughusaria* *Gmpbg.*, ♀ = *tiliaria* *L.*) (23 f). The sexes are nearly similar in shape, the abdomen of the ♀ much stouter. The ♂♂ have always quite light ground-colour and nearly always blackish or very deep brown distal borders; the ♀♀ have darker ground-colour and are as a rule much more unicolorous. The name-typical ♂ has the ground-colour white and belongs chiefly to colder climates; the normal ♀ is bright brownish orange. — ♂-ab. **albidaria** *Dziurz.* lacks the dark markings except the borders. The *immaculata* *kolleri*. and *nivalis* of the same author are transitions. — ♂-ab. **kolleri** *Dziurz.* has a thick postmedian line (narrow band) present on the forewing. — ♂-ab. **anomalaris** *Huene* is small, strongly dark-dusted, the borders not very black. — ♂-ab. **tristis** *Dziurz.* is much darkened, the hindwing often entirely black. — ♂-ab. **flavescens** *B.-White* has the ground-colour yellow. In Southern England it entirely supplants the foregoing white forms. — ♂-ab. **dziurzynskii** *Koller* (23 g) combines the ground-colour of *flavescens* with the markings of *kolleri*. — ♂-ab. **hirschkei** *Dziurz.* (= ? *iberarius* *Kolenati*) lacks the apical cloud of the forewing but has the transverse stripes well developed. Hochschwab, Tyrol, ?Spain. — ♂-ab. **nigricarius** *Backhaus* (= *tristis* *Th.-Mieg*, *nigricarius*. *fuscantaria*. *cans* *Dziurz.*) both wings almost entirely black or dark fuscous. — ♀-ab. **fuscantaria** *Krulik.* (23 g) is a nearly uniform infuscated form, perhaps corresponding to *nigricarius*. — ♀-ab. **unicolora** *Strand* is uniform ochreous. — *strigata*. ♀-ab. **strigata** *Dziurz.* is a banded form, corresponding to *hirschkei*. Other aberrations have been named by *DZIURZYNSKI*. — Larva smooth, cylindrical, green with longitudinal white, dark-edged lines running from head to anal end. On *Pinus sylvestris*, often in such abundance as to defoliate whole tracts of forest. The pupa hibernates. Moth in May—June. Central and N. Europe, Castile, Transcaucasia, Altai, E. Siberia.

vestalis. **B. vestalis** *Stgr.* (23 g) is larger, broader winged, white, with large cell-spots and quite differently shaped blackish border to the forewing. Forewing beneath also with the dark clouding more restricted. ♀ unknown. Amurland: Raddefka; Japan: Hakodate. Apparently not common.

cembraria. **B. (?) cembraria** *Motsch.* may be mentioned here, though I cannot at all identify it. „♂. Form of *piniaria* but larger. Cinereous testaceous, forewing above distally broadly infuscated, with a line and two transverse spots fuscous, hindwing above in the middle somewhat fuscous; underside transversely marked in the middle by a dark line; antenna strongly pectinate; legs reddish testaceous.“ Amur.

150. Genus: **Selidosema** *Hbn.*

Characters of *Boarmia*, subgenus *Cleora*, which MEYRICK unites with it. Antenna in ♂ rather short, plumose. Wings in ♂ ample, ♀ considerably smaller; hindwing perhaps relatively larger than in *Boarmia*, its distal margin slightly or quite moderately crenulate. Not a very scientifically grounded genus, yet somewhat different in aspect and habits from *Boarmia*. Larva without protuberances, living on low plants. Range not definitely ascertained.

plumaria. **S. plumaria** *Schiff.* (= *brunnearia* *Vill.*, *ericetaria* *Vill.*, *vespertaria* *Esp.*) (23 g). Brown or purple-brown with dark discal dots or spots, the lines and distal band usually indicated on the forewing, but very variably, the lines wanting on the hindwing. ♀ much smaller-winged than ♂, with stout abdomen, moderately well marked. It is distributed in Central and Southern Central Europe, Asia Minor, Transcaucasia. — *pyrenaearia*. *Bsd.* has a very strongly expressed dark median line but the dark marginal band obsolescent. Pyrenees and Spain. — *pallidaria* *Stgr.* is a very weakly marked, cinereous whitish form from Sicily, Dalmatia, etc. — *syriacaria*. *Stgr.* shows a similar pale ground-colour but the discal spots, median line of forewing and submarginal bands are well developed. Syria. — *scandinaviaria* *Stgr.* is dark violet-grey, the median line present, the distal bands strong and broad. Scandinavia. — *oelandica* *Wahlgren* is a modification of the preceding, perhaps less dark grey, with an additional dark band occupying the entire space between median and postmedian lines, which are both black. Oeland. Perhaps not separable from the following. — *oliveirata* *Mab.* Similar to *scandinaviaria* but with a broad fuscous median band on the forewing. Portugal. — *granataria* *Rbr.* seems to be also an aberration of *plumaria*, with the median shade of the forewing composed of 3 spots, the pale subterminal line (band) unusually distinct. Andalusia. — Egg oval, with rows of hexagonal cells, each marked at four of the angles with minute raised darker knobs. Larva smooth, with a point at anal extremity; grey, with irregular double dark dorsal line and pale lines on the sides, the lower one edged above with reddish brown. On *Calluna* and other low plants, hibernating. The moth frequents heaths or rough chalk-hills, etc. July—August.

modestaria. **S. modestaria** *Püng.* is considerably smaller and more slenderly built, the pectinations of the ♂ antenna less bushy, decreasing in length towards the tip; face more protuberant; palpus shorter. Forewing

pale brownish grey, with quite sparse dark strigulation, cell-spot elongate, thick; lines obsolescent, widely separated, distal area with some vague spots. Hindwing with small, weak cell-dot. Underside with the cell-dots. Syr-Daria: Baigacum.

S. taeniolaria Hbn. (23 g). More *Boarmia*-like than the preceding, though rather short-winged. Brown *taeniolaria*. with strong dark irroration, tending to form strigulation in the distal area; lines denticulate, strongest on the costa of the forewing; median shade also present. Larva smooth, tapering slightly anteriorly; yellow grey (sometimes darker grey), with numerous longitudinal grey lines. On Genista, also on Prunus spinosa. *taeniolaria* is common in S. France and Spain, but is also known from Switzerland (Canton Geneva).

S. erebaria Ob. (23 g) is distinguished by the peculiar curved form of the narrow median area. Pro-*erebaria*. bably related to the following. Algeria.

S. ambustaria Hbn. (= duponchelaria Lef.) (23 g). More variegated than *taeniolaria*, the ground-*ambustaria*. colour being lighter, the brown strigulations and cloudings richer, the black lines sharply expressed. The discal spots are conspicuous both above and beneath, that of the forewing large and roundish. Underside well marked. ♀ wings much smaller, scarcely fitted for flight. — Larva brighter yellow than that of *taeniolaria*, with squarer head. On Hypericum. Inhabits Sicily and N. Africa.

S. combustaria Püng. Very near *ambustaria*, rather smaller and stumpier, lighter and more yellowish, *combustaria*. wanting the dark strigulae, subterminal line much more bent proximally in the middle, underside much more feebly marked. Jordan Valley.

151. Genus: **Itame** Hbn.

Characters of *Macaria* but with the distal margins smooth or nearly so, the antenna in the ♂ (in the type species *vincularia* also in the ♀) bipectinate. A widely distributed genus, reaching Australia and North and South America. Commonly known as *Thamnonoma* Led.

A. ♀ fully winged (*Itame*).

I. vincularia Hbn. (23 h). May be known at a glance by the large dark cell-spot of the forewing and the *vincularia*. red-brown outer band (less dark in the ♀) cut by light veins. — Larva rather slender, with small bifid dorsal prominences on the 1st, 2nd and 8th abdominal segments and lateral carination; reddish brown dorsally, bluish grey ventrally, with a fine, uninterrupted brown dorsal line and a broad pale lateral stripe. On Rhamnus infectorius. Moth in two generations, S. France, Spain, Portugal and Algeria.

I. spodiaria Lef. (= semicanaria Frr., cerataria Guen.) (23 h). Rather longer winged and less robust. *spodiaria*. Light grey or brownish grey, clouded with darker, more bluish grey distally to the postmedian line. On the underside this clouding becomes brown and very conspicuous, at least on the hindwing and the anterior part of the forewing. S. Italy, Sicily, S. Spain and N. Africa.

I. berytaria Stgr. (23 h). Near *spodiaria* but still longer winged, ♀ abdomen robust, ground-colour less *berytaria*. brownish grey, discal spot of forewing larger, underside with less well defined brown distal shades, the hindwing here characteristic, though very variable, the region of the cell-fold and radial fold, as also the inner margin, whitish grey, the rest darker grey mixed with brownish, some fuscous clouding in the cell and the distal area, a fuscous (sometimes strong, sometimes very slight) postmedian band or double line. Syria and Palestine.

I. buffonaria Mill. (25 h), only known from the type ♀, which was bred at Hyeres as long ago as 1855, *buffonaria*. still requires elucidation. It is a tiny, narrow-winged species, with both wings rather acute at the apex, clay yellowish (rather reddish in the figure) with slight brown dusting; forewing with 2 sharply defined brown lines, the anterior vertical, though slightly flexuous, the postmedian nearly parallel with the distal margin, broadly shaded with brown distally; discal dot large, brown; distal margin with 8 dark dots; fringe short. Hindwing without markings.

I. wauaria L. (23 h). Variable, but easily distinguished from all the other Palearctic species, its nearest *wauaria*. relatives being N. American. The shape approaches that of *Macaria liturata*. Lines obsolete, except at costa and as small vein-dots, median shade on the contrary very strong, at least anteriorly, normally forming a large, somewhat V-shaped mark; the dark red-brown costal mark before the subterminal is nearly always conspicuous. — ab. **v-nigraria** Hatchett (= fuscaria Thnbg. nec Vill.) has both wings strongly infuscated, the *v-nigraria*. V-mark showing in deeper black, postmedian dots also just traceable. — ab. **alba** ab. nov. has the ground-colour *alba*. almost pure white. — **halituararia** Guen. is a more unicolorous ashy or violaceous grey (less brownish mixed) *halituararia*. race, with better developed antemedian line, no whitish irroration on hindwing, etc. According to GUENÉE a species, with much longer antennal pectinations. Altai and E. Siberia. — Egg elongate oval, brown-red, with strong, somewhat irregular polygonal reticulation and whitish knobs at the angles; hibernating. Larva moderately stout, green or purple-brown, the lines white, lateral stripe broad, yellow, tubercles black, setae more

conspicuous than in most Geometrids. On gooseberry. *wauaria* is distributed in Northern and Central Europe, Central Asia and N. America, flying in July.

costimaculata. **I. costimaculata** Graes. Very similar to *wauaria*, forewing relatively somewhat broader, light clay yellowish, somewhat darker distally, median costal spot less oblique, not forming with the cell-spot a V-shaped mark, underside brighter, golden-yellow. Amurland.

sparsaria. **I. sparsaria** Hbn. (= *tephraria* Bsd., *acquiaria* Mill.). Although known since the days of HÜBNER, this species has remained a rarity, confined to a few localities in N. and Central Italy. Whitish grey with darker irroration, discal and terminal black dots and fine dark lines, accompanied by brown shading; the postmedian of the forewing makes two very slight curves, separated by a very slight angle or bend opposite the discal dot. Hindwing very bluntly (scarcely noticeably) elbowed at the 3rd radial. June and again in late summer.

gesticularia. **I. gesticularia** Hbn. (= *graellsaria* Feisth.) (23 h) may be known by its very pale colour, rounded hindwing, slender greyish lines, the median straight, present on both wings, the postmedian marked with dots on the veins. — *inquinataria* Bsd. is a very small form from Andalusia, according to GUENÉE with rather less straight median shade. I have not seen it. — The larva is said to feed on oak. *gesticularia* inhabits Spain, Portugal and Algeria, May—July.

contaminaria. **I. contaminaria** Hbn. (≠? *numerata* F.) (23 i). Forewing slightly more pointed, hindwing with an appreciable sinus in middle of distal margin. Rather more ochreous, with stronger irroration, the lines more brownish, less straight, the postmedian stronger, usually a brownish smear at the median branches, running towards the distal margin. Central France to Central Italy.

fulvaria. **I. fulvaria** Vill. (= *brunneata* Thnbg. nec Goeze, *pinetaria* Hbn., *quinquaria* Hbn., *sylvaria* Curt.) (23 h) differs from all the other *Itame* species in its bright ochreous colour. In the ♂ the lines are very inconspicuous, on account of an almost uniform red-brown irroration; in the ♀ they are well expressed. — In ab. *unicinctata* Strand the median line is strong on both wings, but there are no other markings. — *sordida* Btlr. (described as *Cleogene*) is rather duller coloured, weakly marked, the abdomen dorsally more tinged with fuscous. Japan. — Egg oval, pink, with strong, regular hexagonal reticulation and small bright white knobs at the angles. Hibernating. The larva feeds up in the early months of the year on *Vaccinium*, especially *V. uliginosum*. It is nearly cylindrical, but somewhat folded laterally, the colouring arranged in a multitude of longitudinal lines, mainly green dorsally but with reddish-brown subdorsal stripe, white tinged with yellow laterally, dirty whitish ventrally. N. Europe, the mountains of Central Europe, parts of Siberia, Japan and N. America, thus very widely distributed.

B. ♀ wings rudimentary (*Dysmigia* Warr.).

loricaria. **I. loricaria** Ev. (= *vinctaria* Z., *julia* Hulst) (23 i). The ♂ shows a delicate light violet-grey ground-colour which is not infrequent in this genus, but is characterized by the row of rust-coloured spots which precedes the subterminal line. The ♀ wing-stumps are rather more brownish, with distinct discal dots and lines. Egg apparently similar to that of *wauaria* but less elongate, the cells between the reticulation less deep. Local, Scandinavia to the Ural, Kentei Mountains, N. E. Siberia and N. America. Flies in July.

152. Genus: **Diastictis** Hbn.

Differs from *Itame* (which, however, could probably be sunk to it) in the longer palpus and more pointed forewing.

artesiaria. **D. artesiaria** Schiff. (= *festucaria* Hbn.) (23 i). Coloration of the preceding, recognizable by its shape, the nearly straight, yellowish-white postmedian line and the less developed, more irregular rust-coloured shades beyond (strongest in the middle of the wings). — The egg hibernates. Larva blue-green, with dark, whitish-edged dorsal line, whitish subdorsal and yellowish lateral stripe. On *Salix*, in May. Moth in July, occasionally later. Central Europe, Russia, the Caucasus, Kentei Mountains and Amurland.

serenaria. **D. serenaria** Stgr. (24 c). Very near the preceding, somewhat broader-winged, larger and lighter, with better developed dark transverse markings, especially a fuscous band (more mixed with rust-colour in the middle) distally to the postmedian line. Uliassutai district.

latefasciata. **D. latefasciata** Stgr. is doubtfully referred to this genus and I have no personal knowledge of it. Not quite so large as *serenaria*, forewing dirty ash-grey with very broad dark dull brown median band, not quite

reaching the costa, almost straight-edged proximally, its distal edge gently curved outwards, midway between this band and the apex the costal commencement (broken into spots) of a submarginal band. Hindwing dirty light grey, with an extremely indistinct darker band in the middle, only at its distal boundary somewhat more distinct. Forewing beneath darkened proximally, with broad lighter distal part and light, strongly dark stri-gulated costal margin. Uliassutai district.

D. anomalata Alph. (= *adzearia* Ob.) (24 c). Ground-colour more white, more strongly irrorated, than *anomalata*. in the typical species and recognizable at a glance by the strongly incurved postmedian line, white subterminal (especially at the apex) and other characters. Amdo, Koko-Nor and W. China.

153. Genus: **Lithina** Hbn.

Face smooth or ending in slight pointed tuft below. Palpus shortish or moderate. Antenna in ♂ simple. Forewing without fovea; apex more or less pointed, distal margin smooth, 1st subcostal free, or very rarely connected with 2nd, 2nd from cell, often anastomosing or connected with 3rd—4th. Hindwing with costal margin rather long, distal margin smooth. — Larva smooth, cylindrical, of normal proportions. Range: Palearctic and Nearctic. Certainly not related to *Chiasmia*; the genitalia show Ennomid affinities.

L. chlorosata Scop. (= *innata* Fl., *petraria* Hbn.) (23 i). Quite distinct from all other Palearctic species, forewing light brown, the lines finely whitish, proximally dark shaded, subterminal line rather straight, sometimes indistinct. — Larva moderately elongate, dull green with brown lines and white spiracular stripe, feeding at night on bracken (*Pteris aquilina*). The pupa hibernates and the moth appears in May. Very common in many parts of Central Europe and extending to Asia Minor, N. Persia, the Altai, Amdo district, S. E. Siberia and Japan. *chlorosata*.

L. rippertaria Dup. (23 i). Variable, in the name-typical form easy to recognize by the thick black lines of the forewing, the postmedian curved, somewhat angulated at the 1st radial, both very slight (obsolescent) in their anterior part. — ab. *ravouxi* Th.-Mieg has the black lines united by a thick longitudinal one in front of the 2nd submedian vein. — ab. *pallidaria* Stgr. lacks the black bands. — ab. (?) *irrorata* Chr. is in some measure transitional; irrorated with fuscous, the lines indistinct, fuscous, not black. N. E. Siberia and Ili district. — A very local species, inhabiting S. France, N. Italy, S. E. Russia, Transcaspiia, the Kentei Mountains, etc. — Larva very like that of *artesiaria*, moderately elongate, smooth, bluish green with fine dark dorsal line, fine geminate whitish subdorsal and broad straight white lateral stripe. On Salix. — *flavularia* Püng. differs from the name-type in having the ground-colour uniform sandy yellow with fine browner irroration. Aksu, together with — ab. *analogaria* Püng., which corresponds to ab. *pallidaria*, lacking the black lines. *rippertaria*. *ravouxi*. *pallidaria*. *irrorata*. *flavularia*. *analogaria*.

L. tancrearia Stgr. (23 i). Superficially rather like a more whitish, more strongly brown-clouded *tancrearia*. *rippertaria*, but with the postmedian line far more bent outwards in its anterior part. Structurally very distinct in its more protuberant face, moderately ciliated ♂ antenna and in having the 1st—2nd subcostal of the forewing coincident, thus not a true *Lithina*. Transcaspiia, Issyk-kul and Thian-shan.

L. convergata Vill. (= *scutularia* Dup., *permutataria* Frr., *peltaria* Bsd.) (23 i) is characterized by the proximal curve of the postmedian line and usually by the conspicuous yellow shading of both the lines. More glossy and less coarsely dusted than *partitaria*, especially in the ♂. Moderately variable. — Larva rather short, cylindrical, grey, with numerous longitudinal dark lines and broad, straight, white lateral line. On *Rosmarinus officinalis*, extremely sluggish. The perfect insect emerges from the middle of October. S. France, Spain and Piedmont. *convergata*.

L. jordanaria Stgr. is described as similar to *convergata* but with the yellow stripes broader and differently formed; antemedian slightly curved outwards, in segments, postmedian running into the costal margin near the apex. E. Palestine. *jordanaria*.

L. partitaria Hbn. (= *bipartita* Rbr.) (23 i). Colouring more washed-out than in *scutularia* Dup., more coarsely irrorated, the yellow lines variable, pale, the postmedian not incurved or only so in its middle part. — ab. *faeculenta* Th.-Mieg is more vinous, little irrorated except at costa, the yellow lines better expressed. — ab. *litoralaria* Trti. is much larger, with brown lines edging the yellow ones on the reverse sides. S. Remo, etc. — Larva moderately elongate, nearly cylindrical, slightly attenuated at the extremities, segmentation distinct; yellowish grey, washed with greenish on the sides of the first 4 or 5 segments; dorsal line very fine, double, interrupted, a sagittate brown pattern on the 1st—6th abdominals, a rather broad, waved, whitish lateral line. On *Teucrium* in the autumn. The pupa hibernates and the principal emergence takes place in the spring, but some pupae lie until August or September. S. France, Spain and Algeria. — *obliterata* Stgr. lacks the yellow lines. The sole example before me (from Tkout, Algeria) has the forewing slightly more elongate and shows on the underside a distinct dark postmedian line (faintly traceable also above), placed nearer the distal margin than the postmedian line of *partitaria*. Algeria and Murcia. *partitaria*. *faeculenta*. *litoralaria*. *obliterata*.

- binaevata*. **L. binaevata** Mab. (25 d) is closely similar to *scutularia* but with more of the grey, strongly dusted ground-colour of *partitaria*. Food-plant and life-history as in *scutularia*, which it represents in Corsica. —
- austautaria*. **austautaria** Ob. (24 c) is referred by STAUDINGER as a variety or aberration to *binaevata*. It is distinguished by having broad blackish shades proximally to the first yellow line and distally to the second; cell-dot sharply black. Oran. — ab. **unicoloraria** Ob. lacks the blackish shades, thus it is not clear in what respect it differs from *scutularia*, except that the postmedian line is probably shaped more as in *partitaria*.

154. Genus: **Chiasmia** Hbn.

Characters of *Macaria*, the fovea not very strongly developed, distal margin of forewing not excised in anterior part, that of hindwing only slightly prominent at the vein -ends (especially 2nd subcostal and 3rd radial). Probably not separable from *Macaria* on a scientifically grounded system, the slight difference in habitus being evidently due to its having acquired a diurnal flight. Contains properly only a few Palearctic species, but we have followed WARREN in adding the *strigata* group, which extends into the Indian fauna.

- clathrata*. **Ch. clathrata** L. (23 k). Extremely variable, though the dark transverse stripes and dark veins give to nearly all the forms a characteristic latticed appearance. Fringes sharply chequered (white and fuscous).
- cingularia*. Antennal ciliation short. — ab. **cingularia** Hbn. (= *albicans* Ob.) is almost or entirely without dark markings except the median line, which is sharply expressed. — ab. **cancellaria** Hbn. (= *radiata* Haw.) has all the transverse markings present, but narrowed into mere lines. — **retata** Haw. is almost the same or slightly intermediate towards the type. — ab. **fasciata** ab. nov. has the median area of both wings darkened into a broad band. —
- ornataria*. ab. **ornataria** Krulik. has the distal area of both wings broadly dark fuscous, with white subterminal spots
- nocturnata*. small or almost obsolete. — ab. **nocturnata** Fuchs (= *nigricans* Ob.) (24 c) is dark throughout both wings, excepting the subterminal spots and the chequered fringes. — **aurata** Trti. (23 k) has the ground-colour deeper gold-yellow, without any white admixture. Sicily. — **chretieni** Th.-Mieg. Ground-colour pure white, without yellow admixture (except slightly on the underside). La Grave (Hautes-Alpes); also in N. Britain, etc. Thus
- punctata*. the colour-changes appear analagous to those of *Bupalus piniaria*. — **punctata** B.-Haas. Ground-colour also pure white, reduced to spots and dots by extension of the black markings. Juldus district, in numbers. —
- centralasiae*. **centralasiae** Krulik. is a very small, very dark race from Prshevalsk (E. of Issyk-kul), approaching ab. *nocturnata*. Perhaps synonymous with *punctata*. — Egg oval, dark green, with regular (chiefly hexagonal) reticulation and strong white knobs at the angles. Larva smooth, cylindrical, reddish or brownish green with indistinct lines and broad white lateral stripe, dark edged above. On clover, lucerne, etc. Moth in May—June and again in August, flying in sunshine. Generally common in Europe, Western and Central Asia and across Siberia to Japan. The eastern specimens before me show a combination of the *chretieni* and *cancellaria* characters.
- glarearia*. **Ph. glarearia** Brahm (23 k) differs in having stronger dark irroration, much weaker and differently placed transverse markings, no darkened veins and in having the ♂ antenna dentate-fasciculate. Intermediate towards *Isturgia* — ab. **lutea** Gillm. Markings almost entirely suppressed, the dark irroration indicated at the costal margin of the forewing only, the lines shown by some slight irroration. — Egg oval, flattened, granulated. Larva green with red-brown dorsal spots, or reddish grey; subdorsal line and lateral stripe whitish. On *Trifolium lupulinus*. Moth in April—May and again in August, Central and Southern Europe and distributed to Central Asia.
- saburraria*. **Ch. saburraria** Ev. is said to be related to the preceding but ash-grey mixed with brownish, with 2 brown lines and black discal dots. Irkutsk and Amurland.
- legataria*. **Ch. legataria** H.-Sch. (25 i) is also unknown to me in nature and no description exists. According to the figure it is very distinct in its larger size, more elongate wings, bright yellow, finely dark-dusted ground-colour, red-spotted costa, reddish fringes, etc. Both wings have a dark discal dot, the forewing two somewhat interrupted dark lines, the hindwing one, all accompanied by some reddish shading at the hind (inner) margin. Asia Minor and W. Kurdistan.
- pygmaearia*. **Ch. pygmaearia** Leech (23 k) and the following species belong to a group of closely allied forms which range from N. India and Sumatra to Formosa and Japan and differ from true *Chiasmia* in the longer forewing, with more curved distal margin and more strongly developed fovea. *pygmaearia* is easily recognizable from our figure but is possibly only a form of the Indian *radiata*, which, however, has broader dark markings and less curved median shade. Chang Yang.
- lutearia*. **Ch. lutearia** Leech (23 k). Larger, longer-winged, antennal ciliation rather stronger, the dark markings much increased, both wings with large cell-spot. Japan: Oiwake.

155. Genus: **Tephрина** *Guen.*

Characters of *Itame* and *Diastictis*, generally differing from the former in its longer palpi (with more exposed 3rd joint) and from the latter in the less acute apex, but almost certainly not a biologically or structurally tenable genus. Forewing with 1st subcostal frequently arising from costal. Distributed in all the great faunistic regions; some of the species have a very wide range in the Old World.

T. arenacearia *Schiff.* (= *irradiata* *Walk.*, *imperfiata* *Walk.*) (23 k). Variable, but the variation is *arenacearia*. individual, sexual and seasonal rather than geographical. Recognizable by its rather pointed forewing, position of the postmedian line and generally a clear pale line accompanying it proximally. Ground-colour very pale straw-yellowish, the forewing in the ♂ generally almost entirely suffused with reddish grey, in the ♀ much freer from suffusion, except a band distally to the postmedian; both sexes here often with a row of dark spots, which, however, vary greatly in number and intensity. — gen. aest. **flavidaria** *Ev.* (= *discriminaria* *flavidaria* *Walk.*) has the groundcolour deep, bright ochreous (perhaps deepest in some eastern specimens). — Larva smooth, slender, yellowgreen, with white longitudinal lines and lateral stripe, head with a purple-brown dash on the side. On *Coronilla varia* and probably other allied plants, June and September. The pupa probably hibernates, the moth appearing in May and again in August. Local in E. Europe, also ranging from N. Persia to Amurland, Korea, N. China and Japan. Very common in N. China.

T. (?) flavescens *Alph.* is coloured like *arenacearia* f. *flavidaria* but has short palpus, larger discal dot, *flavescens*. 1st line obsolescent, postmedian formed into a narrow brown band, on hindwing incomplete, anterior half of fringe of forewing brown. Ordos (N. China) in September.

T. murinaria *Schiff.* (= *myosaria* *Esp.*, ♀ *disspersaria* *Hbn.*) (23 k). Rather broader-winged, the ground-colour not or scarcely yellowish, with dense brown or fuscous irroration, postmedian line further from distal margin. Antennal pectinations quite short. In the name-type the markings are well expressed. — ab. **cineraria** *Dup.* is a less marked, nearly unicolorous form. — Larva very similar to the preceding, with more rust-brown markings. On clovers and vetches. Times of appearance, etc., as in *arenacearia*, but *murinaria* has a more westerly range, extending from S. France to Issyk-kul.

T. grisolaria *Ev.* (25 i, as *griseolaria*) differs from *murinaria* in its considerably longer antennal pectinations, darker, more olive-grey tone, with stronger black irroration, stronger black discal spots, lines chiefly marked as dots on the veins, hindwing lighter than forewing, underside less yellowish, etc. From the Steppes of S. E. Russia.

T. cinigeraria *Alph.* (25 i) is not a true *Tephрина*. Build more slender, palpus shorter and more slender, forewing with 1st—2nd subcostal anastomosing strongly with costal. Antennal pectinations long and slender. The whitish ground-colour above and beneath is almost entirely obscured by fuscous dusting, leaving free only the ill-defined lines. Amdo and Koko-Nor.

T. vapulata *Btlr.* (= *capulata* *Kirby*, *Leech*) has rather elongate wings, the apex of the forewing somewhat pointed, and might equally well be placed in *Diastictis*. Proximal area weakly marked, postmedian line followed by a brownish band, with small blackish spot or dot behind the 3rd radial of the forewing. Japan.

T. assimilaria *Rbr.* (23 k). By the shorter palpus this species belongs rather to *Itame*, in so far as the two genera are separable (see above). The underside is characteristic; it somewhat recalls that of *I. spodiaria* (23 h), but the hindwing shows longitudinal whitish streaks in the cell and between the veins and the forewing shows a similar tendency in the distal area, especially on the ferruginous brown apical patch. — Larva of moderate length, cylindrical, light yellowish green marked with uninterrupted lines; differing from those of *arenacearia* and *murinaria* in that the head is concolorous, the lines not white (dorsal dark green, subdorsal greyish). On *Genista corsica* and *Ulex*. Double brooded, only known from Corsica and Sardinia.

T. hopfferaria *Stgr.* (23 k). A rather large species, also with comparatively short palpus, coloration nearly as in *murinaria*, irroration coarser and more, irregular, stronger on underside lines not very strong, discal dots large and black, underside brighter yellowish, with darker yellow veins. Very distinct in having the antennal pectinations reduced to scarcely more than strong serrations. Asia Minor to Transcaucasia.

T. catalaunaria *Guen.* (23 l). Slightly rounder-winged than *murinaria*, antennal pectinations much longer, the median shade commonly well developed on both wings, postmedian line generally followed by a dark shade, often with a distinct row of spots, cell-dots generally small or subobsolete. Palpus rather long. Catalonia and Murcia, probably a straggler from Africa, as it is there widely distributed as far as the Cape: also in India.

- pumicaria*. **T. pumicaria** *Led.* (= *osyraria* *Guen.*, ? *inconspicuaria* *Hbn.*) (23 l). Near *atalaunaria* but much smaller, cell-marks much larger in proportion, lines weakly expressed, but the postmedian marked by a distinct dark spot on costal margin of forewing. Andalusia, Syria, Southern Taurus and Caucasus.
- perviaria*. **T. perviaria** *Led.* Another small species, generally distinguishable by its white or whitish band between the median and postmedian lines. The rest of the wing is mostly ash-grey dusted with brown, the antemedian line sometimes lost in the general darkening, the median shade blacker. Syria and Palestine and a variety(?) in India.
- disputaria*. **T. disputaria** *Guen.* A rather striking species, the lines, especially on the forewing, thickened into (or accompanied by) broad blackish shades, which, however, become obsolete towards the costa. The name-type has the ground-colour decidedly tinged with red-brown. — ab. **indotata** *Walk.* (= *martiniaria* *Ob.*) (23 l) is the commoner and at the same time the more striking form, the ground-colour being whitish. — Distributed from the Cameroons across N. Africa and Persia to India and Burma. Other forms of it will be given in vol. 12.
- semilutata*. **T. semilutata** *Led.* A variable species, bearing no resemblance to the others of the genus; moreover the ♂ antenna is not pectinate, scarcely even dentate, furnished with fascicles of cilia. The name-type is dirty yellowish grey, with the dark shade proximally to the subterminal line rather well developed. Altai.
- pruinosa*. Also, though rarely, in E. Asia. — **pruinosa** *Brem.* (= *dictynna* *Btlr.*) (23 l) is rather bright red-brown (yellowish strongly irrorated with reddish). Common in S. E. Siberia, Korea and Japan. Very generally there is
- fentoni*. a conspicuous roundish dark spot behind the 3rd radial proximally to the subterminal shade. — ab. **fentoni** *Btlr.* (= *corearia* *Herz* nec *Leech*) only differs from *pruinosa* in colour, being bright, clear ochreous. — ab.
- fuscata*. **fuscata** *Herz* is much darker than *pruinosa*, dark rust-brown, almost fuscous. Korea and Ningpo.
- biskraria*. **T. biskraria** *Ob.* (24 c) has about the shape of *semilutata*, the colour between the forms *pruinosa* and *fentoni*, antemedian and postmedian lines stronger, the former less curved, the latter on the hindwing sometimes double. Some dark spots sometimes follow the postmedian distally. Antenna in the ♂ bipectinate. Algeria.
- bleusei*. **T. bleusei** *Th.-Mieg* is said to resemble *biskraria*. Possibly an aberration of it. Light yellow ochreous, only with an extremely vague, slightly excurved postmedian line of small spots on the forewing above, both wings beneath also with darker cell-dot. Oran: Ain-Sefra.

156. Genus: **Osteodes** *Guen.*

Face with a sharp projecting tuft. Palpus rather long. Antenna of ♂ with 2 pairs of fascicles of cilia to each segment. Wing-margins entire, or the hindwing nearly smooth, slightly sinuous or bent in the middle. Forewing with strongly developed fovea; 1st subcostal arising from costal, generally anastomosing or connected with 2nd. The typical species are African but the range of the genus is probably wide, as it seems evident that the genus called *Discalma* by MEYRICK and *Tephropsis* by WARREN is not separable from it. Perhaps, even, it should be treated as a subgenus of *Tephrosia*.

- latimargina-ria*. **O. latimarginaria** *Rbl.* (23 l). Easily distinguished from all other Palearctic species by its light bone-colour and very broad dark borders, that of the forewing interrupted by a roughly triangular patch of the ground-colour at apex. Hindwing beneath with some additional clouding at inner margin (only faintly indicated above) and the border traversed by an irregular, pale subterminal line. Belongs chiefly to the region of the Gulf of Aden, but has been taken in S. Algeria.

157. Genus: **Enconista** *Led.*

Face prominent, rounded. Palpus short or shortish. Antenna in ♂ bipectinate to apex, in ♀ strongly serrate or minutely pectinate. Pectus hairy. Foretibia with strong apical hook. Both wings with distal margin smooth. Costal margin of hindwing rather long. A small genus, confined to the S. W. Palearctic Region, showing within its limits some structural variation, probably (as MEYRICK and JOANNIS accept) of generic value.

A. Forewing with 1st subcostal commonly arising from costal, 2nd always from cell. ♂ with fovea (*Enconista*).

- miniosaria*. **E. miniosaria** is an extremely variable species, but split up mainly into two races, true intermediates being quite rare. The shape and structure, however, suffice for its recognition. — **miniosaria** *Dup.* (23 l) has the ground-colour whitish, rather coarsely but irregularly irrorated with fuscous and usually with some reddish scales; forewing with 3 more or less strong dark lines and a dark shade proximally to the subterminal, the latter continued on the hindwing; postmedian line variable in position. Rare aberrations are very densely

dusted with fuscous almost throughout. Chiefly in the Pyrenées Orientales, Spain and Portugal. — **duponcheli** *nom. nov.* (= *perspersaria* Dup. in err.) (23 l) is more unicolorous or spotted, with the lines entirely or almost entirely obsolete. Prevalent in S. France and Piedmont, recorded also from Spain, the Southern Tyrol, Dalmatia and N. Africa. — Larva smooth, regularly cylindrical, dorsal area violaceous with a brown dorsal line and pale yellowish subdorsal; lateral stripe broad, white, with yellow spots; venter more flesh-coloured, with 3 blackish lines. A rarer variety is green dorsally. On *Genista* and *Ulex*, producing the moth in August–September.

E. exustaria *Stgr.* (23 l) is on an average rather smaller, the postmedian line generally finer and sharper, the subterminal shade placed further from the distal margin, thus close to the postmedian line; distal area conspicuously lighter than the rest of the wing. Cell-spots rather large and black. Underside mixed with brighter brown. Antennal pectinations shorter. Palestine, Tangier and Mogador.

B. Forewing with 1st–2nd subcostal stalked, their stalk anastomosing or connected with costal. Fovea wanting. Middle of face with an oval prominence, the extremity of which is truncate and rugose (*Paronychora* Joan.).

E. oberthüri *Vazquez* (24 d). Ground-colour whitish, but almost entirely covered with dark irroration; lines well expressed. Occurs in September. Madrid, Salamanca and Portugal (Serra da Guardunha). — **inclarata** *Joan.*, from Madrid and Serra da Guardunha, has the whitish ground-colour predominant, the irroration being greatly reduced. — ab. **perfusaria** *Joan.* is unicolorous brownish grey, finely irrorated, the lines wanting, thus parallel to *miniosata duponcheli*. Madrid and Salamanca.

C. Forewing with 2nd subcostal arising from stalk of 3rd–5th. Fovea wanting (*Onychora* Meyr.).

E. agaritharia *Dardoin* (24 d). Larger than *oberthüri*, the ♂ with more ample hindwing. Easily recognized by its almost uniform brown-grey colour, only at times a little more brown in the median area or with the lines slightly indicated; scaling rather smooth and glossy, dark irroration fine, slight and inconspicuous. ♀ smaller and narrower than ♂. Larva elongate, smooth, cylindrical, recalling *Selidosema*; grey, washed with flesh-colour and vinous and with numerous very fine darker and lighter longitudinal lines. Only recorded from S. France and Andalusia. — **mauretanica** *Stgr.* is diagnosed as darker, more distinctly striated and dotted. According to JOANNIS probably a separate species, with still smoother scaling, the sexes alike in size. N. Africa.

D. Face nearly as in Section B. Forewing with 1st and 2nd subcostals arising from cell, free. Fovea wanting (*Scodionista* Joan.).

E. amoritaria *Püng.* Size of *exustaria*, abdomen more slender, pectinations much longer. Reddish sand-colour, discal dots variable in size, lines not very distinct, consisting of small dashes on the veins connected by a very fine line, pale subterminal line with some dark shading proximally. Palestine.

158. Genus: **Scodiomima** *Stgr.*

Characters of *Dyscia*, palpus of moderate length, with long projecting hairs beneath, hindwing with 2nd subcostal very shortly stalked with 1st radial. A perhaps unnecessary genus, created for the single species here given.

S. crocallaria *Stgr.* (24 d). Forewing very pale yellowish with indistinct brown irroration; discal spot large, paler in the centre; antemedian and postmedian lines present. Hindwing more whitish, almost unmarked. Underside pale and weakly marked. Transcaspia.

159. Genus: **Dyscia** *Hbn.*

Face more or less rough-scaled, but without tuft. Palpus generally short. Tongue rudimentary or wanting. Antenna in ♂ bipectinate. Pectus and femora hairy. Wings with distal margins smooth, costal margin of forewing almost straight or even faintly subconcave. No fovea. All veins present, 1st and 2nd subcostals usually free. ♀ with abdomen robust, wings sometimes reduced. — Larva with raised abdominal warts, 8th abdominal segment with thorn-like dorsal process, anal end with 2 strong points projecting backwards. — A not very extensive genus, Palearctic and Aethiopian. The more robust species appear to show some affinity with *Crocallis*.

A. Antenna in ♀ simple (*Dyscia*).

D. emucidaria *Hbn.* (24 d). Slenderly built, forewing greyish ochreous with rather sparse dark dusting, sometimes with a slight rosy suffusion, hindwing white, towards distal margin becoming concolorous with forewing; discal marks elongate, equally distinct on the underside; the postmedian dots are also usually indicated beneath. The spots or blotches in distal area of forewing are variable. ♀ smaller, with stout abdomen. Larva very variable in colour, clay-yellowish to purple-black, the lines wavy. On *Artemisia campestris*, hibernating. Moth in June–July, only known from S. France.

- penulataria*. **D. penulataria** Hbn. (= favillacearia Dup. nec Hbn., ?rubentaria Rbr.) is more robust, the lines sometimes better indicated, the postmedian crenulate, rather strongly curved anteriorly on the forewing. The original figures show a reddish grey ground-colour, coarse irroration, and a darkening in the distal area. I have not seen examples agreeing with them. THIERRY-MIEG doubts its distinctness from *lentiscaria*. Recorded from Digne, the Pyrenees, Spain and Portugal and N. Africa, but STAUDINGER includes here the following form and perhaps *plebejaria*. HÜBNER figures also a strongly infuscated aberration. — **hispanaria** Mill. (24 d). is a redder form, superficially recalling *Enconista miniosata*; ♂ dusted with brown, ♀ clearer reddish. In contrast to the preceding species, the ♀ is larger than the ♂. — Larva argillaceous grey, the dorsal and subdorsal lines brown, lateral stripe yellowish. Chiefly on Dorycnium, possibly double brooded. Described from Barcelona; recorded also from the Pyrenées Orientales. According to THIERRY-MIEG a good species, of less robust build than *penulataria*, with more silky, weakly-marked wings.
- plebejaria*. **D. plebejaria** Ob. Similar to *hispanaria* (24 d) but smaller, with larger cell-spots, that of the forewing more or less pale-centred. Algeria: near Sebdou, February and August.
- fagaria*. **D. fagaria** Thnbg. (= belgaria Hbn., belgiaria Bkh., mediopunctaria Don.) (24 e). Face nearly smooth. Tongue present, though rudimentary. Thorax not robust, not densely hairy. ♀ with stout abdomen and narrow wings. Variable. The name-typical form is moderately strongly irrorated, the markings strong, including a well-developed postmedian line on the hindwing. Northern Central Europe, S. E. Russia and the Caucasus. — *alvarensis*. **alvarensis** Wahlgren is rather a light form and weakly marked, the lines only distinct at the margins. Oeland. Probably differs little from the following. — **favillacearia** Hbn. is cinereous, not densely irrorated, the lines somewhat broken into vein-dots, that of the hindwing almost or quite obsolete. Austro-Hungary and Galicia, Ili and Issyk-kul. — ab. **fleischmanni** Rbl. is almost unicolorous black-grey. Taken among *favillacearia*. — *psoricaria*. **psoricaria** Ev. is a dark, densely irrorated form from the Ural, Transcaucasia and Transcaspia. — **albidaria**. *albidaria*. Stgr. ♂ almost white, with little irroration, markings strong. England, W. France, Belgium and N. W. Issyk-kul, often together with the type. — Larva dungy brown, with a whitish dorsal stripe and some grey markings on the sides. On Calluna and Erica, hibernating and feeding up in the early spring. The moth appears in June or sometimes earlier. It inhabits northern central Europe, Russia and the Caucasus.
- conspersaria*. **D. conspersaria** Schiff. (= cunicularia Esp.) (24 d). Wings broader than in *fagaria*, especially the hindwing; ♀ not smaller or narrower than ♂. Markings generally weak, postmedian line of dots on both wings more parallel with distal margin. The name-type is yellowish white, with more or less strong fuscous irroration. — *turturaria*. — ab. **turturaria** Bsd. (= conspersaria Hbn.) is whiter, much less densely dusted, but various transitions occur. — *cuniculina*. S. France, Carniola, W. Asia Minor, etc. — ab. **cuniculina** Hbn. is still whiter, the dusting wanting. S. Russia, Italy, Brusa district, etc.; as a local race in the Pyrenees. A similar example is before me from Quetta. — Larva reddish grey, with double white dorsal line, expanding in the middle of each segment, fine wavy yellowish white subdorsal and indistinct brownish lateral line. On Salvia and Artemisia. Moth in May—July.
- raunaria*. Central and S. Europe, N. Africa, Asia Minor, Ferghana, Issyk-kul. — **raunaria** Frr. is a smaller, rounder-winged, chalky white insect with rather sparse irroration, a postmedian row of fuscous dots, etc. Said to have shorter palpus, which would indicate a separate species. Carinthia, Istria, Fiume and Herzegovina.
- duponti*. **D. duponti** Th.-Mieg. Shape and facies of the preceding. Pure white, without a trace of the ordinary lines of *Dyscia* but with orange spots on the forewing mixed with some black scales, namely a large cell-mark and 2 submarginal spots at 4 mm. from the termen, placed about as in *fagaria*. Algeria.
- holli*. **D. holli** Ob. Rather larger than *duponti*, with similar black-mixed submarginal blotches but with the ground-colour of the forewing and the inner and distal margins of the hindwing almost as red as in *hispanaria* (24 d). Algeria, in May. — **albirosea** Rothsch. is evidently a form of *holli*, the ground-colour rather paler, costal margin of forewing with 2 brick-red patches, the submarginal blotches less developed, hindwing with brick-red dots in abdominal area. Algeria and Morocco. Also known to me from Cape Colony.
- tekkearia*. **D. tekkearia** (25 a) is described as nearest to *conspersaria*, whitish cinereous with brownish irroration, the lines not broken into dots, antemedian not very distinct, postmedian angulated near the costal margin of the forewing, both lines well expressed on the hindwing; the median shade of the forewing is indicated by a costal spot close to the cell-spot. Achalzik, Transcaspia.
- lentiscaria*. **D. lentiscaria** Donz. (= turturaria H.-Sch., nec Bsd.) (24 e) is distinguished by its more strongly hairy thorax, hairy face and less short palpus, clothed with longer hair. In markings not unlike *fagaria*, colour rather more yellowish. ♀ not smaller than ♂. — **distinctaria** B.-Haas, from St.-Ildefonso, Castile, is clear white, little irrorated, the lines weak, rust-brownish, not black. — Larva brownish grey, with broad red-brown dorsal line, the other lines indistinct. On Helianthemum, hatching in April and scarcely growing till August or September.

then feeding up rapidly. S. France and Spain. A variety reported from S. E. Armenia. — *aspersaria* Stgr. (= *in-aspersaria* Stgr., nec Guen.) is narrower winged, the thorax not quite so densely hairy, less yellowish above, the antennal pectinations yellowish (in *lentiscaria* darker). Issyk-kul and Ili district.

D. leucogrammaria Püng. Robust build and wing-shape recall *aspersaria*. Different from all the other *leucogrammaria* species in having distinct white lines (on forewing 2, on hindwing 1) on the brown-grey, white-dusted ground-colour. Antemedian line dentate outwards on median and submedian veins. Cell-spots rather large, dark grey. Ashabad, second half of May.

B. Antenna short, in ♀ bipectinate (*Zuleika* B.-Haas).

D. nobiliaria B.-Haas may be separated at a glance from all its similarly coloured allies by the *nobiliaria* white or whitish costal margin of the forewing. ♀ considerably larger than ♂. Underside in ♂ mostly dark grey, in ♀ rather lighter. Algeria.

160. Genus: **Xenobiston** Warr.

Apparently quite like *Dyscia* subgenus *Zuleika*, but the ♂ hindtibia with terminal spurs only. Forewing with 2nd subcostal connected with 3rd—4th. Only one species.

X. casta Warr. Whitish grey, the ♀ paler, the median area of the forewing bright flesh-colour or salmon-colour. Egypt: Wady el Natron.

161. Genus: **Crocota** Hbn.

Face with tolerably appressed scales. Palpus moderate, rough-scaled. Tongue developed. Antenna in ♂ bipectinate to apex. Femora glabrous. Forewing with distal margin entire; fovea wanting; 1st subcostal from cell, connected or sometimes anastomosing with costal; 2nd from cell, usually connected with 3rd—4th. Hindwing with distal margin feebly sinuate between the radials. ♀ smaller and more pointed-winged than ♂, with robust abdomen. — Egg oval, smooth, shining, with very slight raised hexagonal pattern. Larva of moderate proportions, cylindrical, carinated laterally, without humps. Feeding on low plants and hibernating. Probably the genus should be restricted to the 3 European species (all inhabitants of the mountains at elevations of 1000 m. and upwards), though various others have been referred here by different authors.

C. lutearia F. (= *tinctaria* Hbn.) (24 e) is distinguished by its uniform bright orange-yellow colour *lutearia* in both sexes. — In ab. *quadripunctaria* Th.-Mieg both wings have a black discal dot above and beneath, — *quadripunctaria*. Larva brownish, the dorsal line interrupted, pale-edged, dark subdorsal and lateral lines uninterrupted. On low plants, hibernating. The moth is on the wing from the end of May to July, flying by day. Alps, S. France, N. Italy, the Carpathians and the Ural.

C. niveata Scop. (= *illibaria* Hbn.) (24 e, f). Closely related to *lutearia* but shining whitish. Larva *niveata* closely similar to the following but more brightly coloured. Styria, Carinthia, Carniola, Transsylvania, ? Tyrol. Flies in July.

C. peletieraria Dup. (24 f). ♂ blackish grey with blacker discal dots, ♀ scarcely distinguishable from *peletieraria* that of *niveata*. The ♂ genitalia show that it is not a mere race of that species, the tegumen being differently shaped and the spines on the clasp collected on a decided projection, which is not the case in either of the allies. Larva pale yellow-brown, rich red-brown and black, the colours arranged in longitudinal lines; dorsal red-brown band with black spot in the middle of each segment, the next red-brown band black at the margin of the segments, the next band wholly dark. Has been reared from the egg on Lotus and dandelion. Moth in July, only known from the Pyrenees and Cantabrian Mountains.

162. Genus: **Siona** Dup.

Differs from *Crocota* in the simple ♂ antenna, narrower wings, especially the long costal margin and produced apical part of the hindwing, in having the 1st and the 2nd subcostals of the forewing generally free and in the earlier stages. Larva rather elongate, anteriorly tapering considerably. Pupa in a spindle-shaped yellow cocon, recalling that of a *Zygaenid*. Only one species known.

S. lineata Scop. (= *dealbata* L.) (24 f). White; upperside with the veins somewhat greyish; underside *lineata* with the veins more infuscated, also the folds, forewing with a large discal spot, a postmedian line usually present, at least on the forewing. Egg oval, somewhat flattened at the ends, orange, with quite shallow, irregular pitting, only stronger at the micropylar end. Larva ochreous or brownish-grey, the markings consisting of numerous irregular wavy lines. On various low plants, hibernating. Moth in June, widely distributed from S. W. France to S. E. Siberia.

163. Genus: **Psyra** Walk.

Differs from *Loxaspilates* in having the face not tufted, the palpus rather short, with 3rd joint small and concealed; wings broader; 2nd radial of forewing more normally placed than in most *Loxaspilates*, 1st subcostal usually anastomosing with costal. Range; India to Japan.

- rufolinearia*. **P. rufolinearia** Leech (24 f). Distinguished by its large size, sinus in distal margin of forewing between apex and 3rd radial, lines marked by black dots on the veins but without black blotches, median line fine and reddish brown, placed rather far distally to the discal dot. Mou-pin, W. China, only the type (♀) known. Probably nearest *diplotata* Feld from India.
- bluethgeni*. **P. bluethgeni** Püng. Distal margin of forewing without excision, slightly bent at 3rd radial; mixed whitish and brown with straight antemedian and median brown lines, the latter the sharper, faintly curved postmedian and whitish subterminal; on the latter stand small black wedge-shaped spots between 5th subcostal and 3rd radial and a bent mark between 2nd median and hindmargin. Japan: Nikko.
- indica*. **P. indica** Btlr. (24 g). Vinous brown, forewing with faint, slightly sinuous lines arising from black costal spots, a subterminal sinuous black line also marked with small black spots from costa to 3rd radial. Hindwing with fuscous suffusion between the median and postmedian lines. Dharmasala.
- angulifera*. **P. angulifera** Walk. (24 g). Purplish grey with the lines represented by vague brownish shades but marked with deep black, yellow-edged, mostly wedge-shaped spots. Dharmasala, etc.
- cuneata*. **P. cuneata** Walk. (25 l). Variable, sometimes exceedingly like *angulifera* but always distinguishable by its light yellow-brown ground-colour. N. W. Himalayas to Japan and Formosa.
- boarmiaria*. **P. boarmiaria** Graes. (24 g). Smaller than *cuneata*, rather lighter still, the black marks at inner margin reduced, not wedge-shaped, etc. Apex of forewing not produced. Radde, Central Amurland.

164. Genus: **Loxaspilates** Warr.

Face with slight or strong projecting tuft. Palpus rather elongate, with 3rd joint distinct. Antenna in ♂ nearly simple. Femora glabrous. Hindtibia in ♂ dilated. Forewing without fovea; rather narrow, with acute apex and oblique distal margin; 1st subcostal usually free; 2nd from stalk of 3rd—5th; 2nd radial usually arising before the middle of the angled discocellulars. Range: N. India, Tibet and China.

- graeseri*. **L. graeseri** (Püng. in litt.) *nom. nov.* (= *boarmiaria* Püng. nec Graes.) (24 g). Remarkably like *Psyra boarmiaria* but distinguished by the structural characters (longer palpus, straight, oblique distal margin and free 1st subcostal vein of forewing), the more uniformly sized black spots and the whiter, weakly marked hindwing, with more conspicuous black cell-dot. Tibet: Koko-Nor. Evidently near the following.
- hastigera*. **L. hastigera** Btlr. (25 k). Forewing pale straw-yellow, clouded with smoky brownish near base and distally to the postmedian and subterminal lines, which are represented by strong black wedges; very characteristic are the still longer antemedian wedges. N. W. Himalayas: Dharmasala and Rala. — **punctigera** *subsp. nov.* has clearer, brighter yellow forewing, with the wedges reduced to dots (the postmedian tending to form very short dashes), the hindwing purer white. Kashmir: Sonamarg, type in coll. Brit. Mus.; a second example from the Scind Valley. Perhaps a separate species.
- obliquaria*. **L. obliquaria** Moore (= *subfalcata* Pouj.) (25 b). Variable, straw-colour or more ochreous, with or without decided darker irroration, best recognized by the arched costal margin and slightly falcate apex and the nearly straight postmedian line, parallel with the distal margin or slightly more oblique; the subterminal blackish dots vary much in development. Afghanistan and N. W. Himalayas to W. China.
- fixseni*. **L. fixseni** Alph. (25 k) seems (from the figure) doubtfully distinct from *obliquaria*, but the postmedian line of the forewing shows an angle close to the costal margin, the subterminal line is perhaps more sinuous, edged distally by a more regular brown line, without black spots and the postmedian line of the hindwing extends further anteriorly. Amdo district.
- arrizanaria*. **L. arrizanaria** Bastelb. (25 k) differs from the more brownish yellow forms of *obliquaria* in that the postmedian line is more oblique, running nearly into the apex, and on the inner margin makes a curve basewards. The incomplete line of the hindwing is more proximally placed. Described from Formosa, where it is constantly smaller than *obliquaria*, but I have before me 3 large specimens from W. China (Pu-tsu-fang and Ta-chien-lu), which should probably be treated as a separate race.

L. straminearia *Leech* (24 g) is smaller, the wings less elongate, the lines diffuse and shadowy. Other- *straminearia*.
wise closely similar to *obliquaria*, but the palpus and frontal tuft appear somewhat shorter. Omei-shan.

165. Genus: **Astrapephora** *Alph.*

Characters of *Aspilates*, apparently scarcely differing except in its more slender build, sharply triangular, pointed forewing and abnormal pattern. Face rough, palpus shortish, rough. Forewing with 1st and 2nd subcostal veins free. Only one species.

A. romanovi *Alph.* (24 g). A very striking insect, recognizable at a glance by the peculiarly shaped, *romanovi*.
longitudinal dark markings of the forewing. ♀ smaller and narrower, more ochreous, especially the hindwing.
Amdo, Koko-Nor.

166. Genus: **Aspitates** *Tr.*

Face shortly rough-scaled, without tuft. Palpus moderate, occasionally rather short, shortly rough-scaled. Tongue rather weak. Antenna of ♂ bipectinate to apex. Femora glabrous or slightly hairy. Hindtibia not or scarcely dilated. Forewing with apex generally acute, fovea wanting (except in *punctaria*), 2nd subcostal not stalked with 3rd—5th (except in *revocaria*). — Larva elongate, smooth, anal end with 2 points projecting backwards. Perhaps distributed in most of the faunistic regions, but not very sharply defined.

A. Antenna in ♀ bipectinate (*Conchia* *Hbn.* = *Megaspilates* *Warr.*).

A. mundataria *Cram.* (24 g). Shining white, the forewing with costal margin narrowly brown except *mundataria*.
towards apex, first line strongly oblique and curved, second nearly parallel with distal margin. Hindwing weakly
marked. Ural to N. Mongolia. — **tonghata** *Feld.* is larger, the markings broader and darker. Korea and Japan; *tonghata*.
transition in Amurland.

B. Antenna in ♀ not bipectinate (*Aspitates*).

A. geholaria *Ob.* (24 i). Only the ♀ known to me. Palpus short, abdomen robust, scarcely a true *geholaria*.
Aspitates. Less pure white than *mundataria*, forewing with 2 fine lines besides a submarginal brown band or
shade, hindwing with the line developed at inner margin, not at apex. N. China: Pekin and Gehol.

A. formosaria *Ev.* (= *gloriosaria* *Bsd.*, *niponaria* *Feld.*) (25 k). Variable in size and somewhat in depth *formosaria*.
of colouring, but quite unlike all the other species, the pale costal margin and the whitish shade proximally to
the fine oblique postmedian line of the forewing may be mentioned as characteristic. Larva violet-grey with a
lighter admixture, a black dorsal stripe distinct on the anterior segments, a black lateral stripe ill-defined
above. On *Caltha* and *Lysimachia*, hibernating. Moth in June and July. Very local in Central and E. Europe,
commoner in Palearctic E. Asia.

A. punctaria *Leech*. Systematic position doubtful. Neuration of *formosaria* (1st subcostal arising from *punctaria*.
2nd, anastomosing with costal) but the forewing with a fovea. Very distinct. Forewing ochreous brown with
dark mottlings and a rather dark distal band preceded by fuscous spots; hindwing very characteristic, whi-
tish with a row of rather large postmedian spots. Tibet: Hou-kow, only the type known.

A. smirnovi *Rom.* (25 k) unknown to me in nature, appears to be another striking species. Forewing *smirnovi*.
deep yellow with reddish brown basal patch ending in a point on median vein and not extending behind sub-
median fold, dark cell-dot and reddish fuscous postmedian band, much broader than in *gilvaria* and *ochrearia*
and containing between the 3rd radial and 2nd median veins two roundish white spots. Hindwing reddish
white-grey with dark postmedian line. Transcaucasia: Tiflis.

A. acuminaria *Ev.* (= *stschurovskyi* *Ersch.*, *glessaria* *Chr.*, *opulentaria* *Stgr.*) (24 h). Palpus rather *acuminaria*.
short, rough-scaled. Pectinations not long. Further characterized by the less smooth distal margin of the hind-
wing, the sinuous postmedian line, dark-shaded distally and not reaching the costal margin, etc. Distributed
in Central Asia.

A. curvaria *Ev.* (= *sterrharia* *Stgr.*) (24 h). Suggestive of narrow-winged *gilvaria*, agreeing in colour, *curvaria*.
but with the line of the forewing curving behind the 2nd median vein and running nearly to the base. E. Siberia,
Uliassutai, S. E. Altai and N. W. China.

A. gilvaria *Schiff.* (24 h). Forewing in the typical form pale yellowish or straw-colour, with a vague *gilvaria*.
cell-spot and distinct oblique outer line, running from the fold to the costal margin close to apex. ♀ narrow-
winged. — ab. **sublataria** *Fuchs* has the upperside almost markingless. — ab. **conspersaria** *Stgr.* is more or *sublataria*.
less densely irrorated with fuscous. Perhaps not distinguishable from the North American *orciferata* *Walk.*, *conspersaria*.

which, however, seems to have rather shorter palpus. Recorded from the S. E. Altai and the Changai Mountains. *nigricans*. — ab. *nigricans* *Jourdhouille* is a more extreme development, almost or quite unicolorous fuscous. Recorded *orientaria*. as a rare aberration in Europe. — *orientaria* *Alph.* is a form from the Caucasus, Thian Shan, Saján and *insignis*. Amdo districts, etc., with little or no dark irroration. — *insignis* *Alph.* is, according to its author, an aberration of *orientaria*, whitish with but little tinge of yellow, the dark irroration partial and irregular. But the entire race is very variable. — Larva ochreous grey, with blackish, ochreous-edged dorsal line and various other fine darker and paler longitudinal lines. On low plants, hibernating. Moth in July—August, widely distributed in Europe (except the North), Central Asia and to E. Siberia. A very close relative in Arctic America, W. Canada, etc. (see above).

- albaria*. **A. albaria** *Bartel* (24 h) is perhaps another form of *gilvaria*, but the ♀ is still narrower-winged and the palpus and tongue appear shorter, the ♂ antennal pectinations decreasing less in length apically. Whitish. the outer line more curved and running further from the distal margin on both wings. Ural.
- collinaria*. **A. collinaria** *Holt-White* (= *hesperis* *Warr.*, *canaria* *Rbl.*) (24 i). Near *gilvaria*, forewing above and both wings beneath deeper, brighter yellow, the line shorter and more curved. Canary Islands.
- ochrearia*. **A. ochrearia** *Rossi* (= *citraria* *Hbn.*) (24 i). Forewing less elongate than in *gilvaria*, much yellower, the markings more blue-grey (not brown), on the hindwing much more strongly expressed; postmedian line less oblique, more sinuous, forewing also with a distinct antemedian line. Hindwing with 2nd subcostal stalked. Not very variable, the ♀ often, the ♂ more rarely with much more copious irroration. — ab. *unicolorata*. **alorata** *Seeb.* has both the wings unmarked on the upperside. — ab. *alba* *Krausse* is almost white, with sharp *aestiva*. markings. — gen. aest. **aestiva** *Schawerda* is generally smaller and paler, more spotted. — Egg deep yellow, oval, but with one end flattened and containing a deep micropylar depression; surface with weak hexagonal pitting. Larva similar to that of *gilvaria*, pale ochreous brown. On various low plants and flowers, hibernating. Moth in May—June and August—September, England, France, S. Europe, N. Africa, Asia Minor and Syria.
- trilinearia*. **A. trilinearia** *Leech* (25 c) is a very distinct species, the forewing brown with 3 white lines, the 2nd and 3rd sinuous. Palpus rather short and stout. ♂ unknown. W. China: Wa-shan.
- revocaria*. **A. revocaria** *Stgr.* is doubtfully placed, the palpus rather short, wings broad, distal margin of hindwing at least as irregular as in *Perconia*, forewing with 2nd subcostal arising from stalk of 3rd-5th. Easily recognized by the shape and the short, thick apical streak. *STAUDINGER's* type has darker dusting, discal dots and fine dark line accompanying the pale one. Underside unmarked. Syria.

167. Genus: **Perconia** *Hbn.*

Essential characters as in *Aspitates*, palpus and tongue rather strong, forewing with 2nd subcostal occasionally stalked with 3rd—5th, hindwing with distal margin sinuous, slightly concave from 2nd subcostal to 3rd radial. — Larva with the posterior trapezoidal tubercles raised on abdominal segments 2—6 (especially those on the 5th); points at anal end less developed. — Only the 3 Palearctic species have been detected. Often merged in *Aspitates*, but the larva and the genitalia suggest that the separation is justified.

- strigillaria*. **P. strigillaria** *Hbn.* (= *respersaria* *Hbn.*) (25 k). White, with fuscous irroration; all the lines present, usually also a subterminal dark line, thus somewhat *Acidaliid* in aspect. Median line (or shade) variable in *herpeticaria*. position and in thickness. — ab. **herpeticaria** *Rbr.* (= *dilatata* *Strandl.*). Antemedian and median lines of fore- *grisearia*. wing thick and closely approximated, sometimes confluent into a band. — **grisearia** *Stgr.* (25 k) is a greyer form the white ground-colour nearly suppressed. Frequent in N. Europe, etc., but not very sharply separable from the name-type. Most British examples are intermediate. — **cretaria** *Ev.* is a clearer white, weakly marked form from S. E. Russia, sometimes quite markingless. — Egg long-oval, straw-coloured, micropylar end broad, with a circular indentation. Larva somewhat thickened posteriorly, grey mottled with brown, the dark dorsal line usually interrupted on the middle segments. On heather, broom, etc., hibernating. Moth in May—June, Europe, Asia Minor and the Tarbagatai Mountains.
- baeticaria*. **P. baeticaria** *Rbr.* (25 l [*boeticaria*]). Similar to large *strigillaria*, dirty brownish, apices rather sharper, *castiliaria*. cell-dots usually larger, very black beneath, fringes dark-spotted. Andalusia. — **castiliaria** *Stgr.* (25 l) is a paler, more yellowish form, the lines showing up distinctly. Castile.
- innocentaria*. **P. innocentaria** *Chr.* (25 l). Ground-colour chalky white, recalling *strigillaria* *cretaria* but generally of larger size and distinguished by the markings. ♂ with strong, ♀ with slight, dark irroration. Forewing with weak (sometimes obsolete) curved antemedian line, both wings with denticulate postmedian line and a brown median shade, that of forewing complete, rather oblique, placed distally to the cell-dot, that of hindwing obsolete at costal margin. Transcaspia.

168. Genus: **Compsoptera** Blanch.

Face rough-haired, crown with a strong pointed crest. Palpus rather short. Antenna in ♂ bipectinate to apex. Thorax densely hairy, more or less crested in front. Femora hairy. Wings rather narrow. Forewing pointed, without fovea, 1st subcostal anastomosing with costal, 2nd arising from cell, anastomosing with 1st and then with 3rd—4th. Hindwing with costal closely approximated to subcostal to beyond middle of cell. — Larva moderately slender, tapering a little at the extremities, without protuberances, the segmentation distinct. — Only known as Palearctic, but with related genera in Africa and Australia.

C. opacaria Hbn. (24 i) is the only species with deeply coloured forewing and is further characterized *opacaria*. by the oblique whitish line, running towards the apex. The name-type is the paler form, forewing reddish grey, though very variable in tone. — ab. **rubra** Stgr., occurring in the ♂ only, is deep brick-red. — Larva grey, *rubra*. with dark dorsal lines, which alternately approach and separate, enclosing dorsal lozenges of the ground-colour; these lines are marked with a black spot on each abdominal segment. On Genista and Dorycnium. A very local species, inhabiting S. France, Italy, Corsica, Spain and Portugal.

C. argentaria H.-Sch. (= yaminaria Ob.) (24 i). Near *opacaria* in shape and structure but very distinct *argentaria*. in colour and in the peculiar longitudinal markings, especially the dark, white-edged line from 2nd median to near distal margin, where it is suddenly bent and runs forward to the apex. Dr. SEITZ informs me it has been bred from Sarothamnus larvae. Sicily and Algeria, considered a great rarity.

C. jourdanaria Villiers (25 l). Narrower, more slenderly built. Recognizable at a glance by the white *jourdanaria*. veins and irroration, and the extraordinarily oblique postmedian line, which runs, in a series of irregular lunules, from the apex to the hindmargin near the base. — ab. **obscura** B. Baker is much darker, forewing fuscous *obscura*. brown with the lines black, hindwing also infuscated. — Larva similar to that of *opacaria* but smaller and without the black spots. On thyme. S. France, Spain and Algeria. — **anargyra** Trti. is rather broader-winged, lighter *anargyra*. grey brownish, more strongly mottled with white. Sardinia.

C. simplex Btlr. (= violentaria Chr.) is a robust species with nearly the scheme of marking of *simplex*. *opacaria*, but quite different in colour, forewing light ochreous brown, with dark oblique line from apex. — ab. **punctaria** Leech (25 l) differs in having the line broken into vein-dots. — S. E. Siberia and Japan. *punctaria*.

169. Genus: **Chemerina** Bsd.

Another rather primitive genus, according to MEYRICK perhaps derived from *Compsoptera*. Build more slender, face smoother, vertex similarly tufted. Antenna of ♂ with apex simple. Femora not hairy. Forewing with 1st subcostal remote from costal, 2nd arising from stalk of 3rd—5th. Only one species has been referred here; a second may, however, be provisionally united with it, although the crest on the head is less developed and the 1st subcostal is connected by a bar with the costal.

Ch. caliginearia Rbr. (= ramburaria Bsd.) (6 i). An obscure species, with somewhat the scaling and co- *caliginearia*. loration of *Pachynemina hippocastanaria*, to which the ♀ bears some superficial resemblance in her narrow wings, etc. The ♂ is larger and ampler-winged. Antemedian line strongly curved, with a pale yellow-brown shade proximally, postmedian rather variable, with a similar shade distally; subterminal line generally broken into dots. — ab. **andalusica** Ribbe is unicolorous reddish grey, lacking the distinct pale bands of the name- *andalusica*. typical form. — Larva slender, smooth, cylindrical, tapering a little anteriorly; dorsal area dark grey with blackish lines, ventral area paler, somewhat bluish; lateral stripe yellowish, very distinct, with a small ferruginous dot on middle of each segment. On Cistus, hatching in April and feeding up very rapidly. Most of the year is spent in the pupa state. Moth in the early spring or even in January. Local in the Mediterranean countries.

Ch. modesta Btlr. (= tristis Leech). Sexes very dissimilar in shape, ♀ formed somewhat as in *cali- modesta*. *ginearia*, ♂ hindwing with long inner margin and irregularly shaped distal margin. Rather darker and less glossy than *caliginearia*, the lines parallel, strongly dentate, the median area sometimes a little darkened. Japan. Perhaps nearer to the Australian *Chlenias* than to *Chemerina*.

Additions and Corrections to Volume 4.

- P. 1 line 24 from bottom, for **obscura** *ab. nov.* read: *ab indigena Lambill.*
 „ 14 from bottom, for „larvae“ read „larva“.
- P. 3 line 20 to *aescularia* add: *ab. astrigaria Rbl.* Both transverse lines wanting, apical streak distinct. Bred from *Acer campestre* at Rodaun.
 line 21 delete the synonym *mellearia Scharfenb.*
 „ 27 to **tenuis** *Bttr.* add: (= *membranaria Christ.*) (3a, fig. 1, as *membranaria*).
 „ 14 from bottom, add: also known from S. E. Siberia.
 „ 13 from bottom, for **A. membranaria** read: **A. punctigera** *nom. nov.* (= *membranaria Leech* nec *Christ.*) (3a, fig. 2, as *tenuis*).
 line 10 from bottom, delete: but also in S. E. Siberia.
- P. 5 line 17 for „on Pl. 1“ read: „Pl. 2“.
 „ 25 to **aequilinearia** *Walk.* add: (= *trilineata Walk.*, *equilinearia Rosenst.*)
- P. 6 line 20 after **berytaria** for *Hbn.* read: *Stgr.*
 „ 21 at the end of *ononaria* add: *ab. blanca Ribbe*, from Andalusia, is almost unicolorous whitish-yellow.
- P. 6 line 6 from bottom, to *discoïdaria* add: In *ab albida Ribbe*, from Andalusia, the forewing is whitish-yellow, the hindwing darkened.
- P. 14 line 17 after Syria add: and N. Africa.
 „ 24 after Spain add: and Algeria.
- P. 18 line 20 from bottom add: Here follows the genus *Chlororithra Btlr.*, of which the only known species is the N. Indian **Ch. fea** *Btlr.* This is figured on Pl. 1 g, but will be dealt with in Vol. 12, as it has not yet been proved to occur in the Palearctic Himalayas.
- P. 19 line 3 for „in“ read: „is“.
 „ 16 for **C. pannosa** read: **S. pannosa**.
 „ 22 for „weekly“ read: „weakly“.
- P. 20 line 24 after Japan add: and Korea.
 „ 6 from bottom add: The figure has omitted the bright pink spot at apex of hindwing, which is the most characteristic feature and was clearly shown in the original drawing.
- P. 21 line 3 to *nigromaculata* add: (3 b ♂, 2 c ♀).
 „ 23 to *C. quadrimaculata* *Btlr.*, for (5 a) read: (5 b).
- P. 22 line 11 for **G. flagellaria** read: **G. albistrigata** *Warr.* (= *flagellaria Pouj.*, *flagellata Pouj. i. tab.*). **WARREN's** name has priority. Add Japan to the localities.
- P. 23 line 23 from bottom, for north-eastern China read: Japan.
- P. 27 line 14 to *Microloxia* add: **M. (?) rhoisaria** *Chrét.* Described from the ♀, tibial armature not noticed, perhaps a *Chlorissa*. Wings broad, pale green, very finely strigulated with white, more weakly than in *pulmentaria*, costa of forewing yellowish white; antemedian line angled at both folds, postmedian

straight at first, then elbowed, inbent, angled inwards on fold, accompanied distally by a very fine whitish line; fringe with a fine pale line at base, then a darker green band. Hindwing with antemedian line almost obsolete. Larva short and thick, carinated laterally, flattened ventrally, incisions well marked; folded transversely (4 folds to a segment), granulated; green, with indistinct double darker dorsal line, lateral ridge yellowish, spotted with rose-colour, central line fine, uninterrupted, yellow. In May on *Rhus oxyacantha*. Biskra.

P. 28 line 17 to **E. prasinaria** add: The larva of *prasinaria* is probably that described by BECKER (Bull. Mosc. Vol. 40: 1, p. 114) from Astrachan or Sarepta, feeding on *Artemisia nutans*. A form of *smaragdaria* or *prasinaria* has recently been recorded by TURATI from Sardinia and the larva (feeding only on *Santolina*) circumstantially described by KRÜGER (Ent. Mitt. Deutsch. Ent. Mus. Vol. 2, p. 110).

P. 28 line 19 from bottom, to **albocostaria** Brem. add: (= *albicostaria* Stgr., *albocostria* Pryer).

P. 29 line 20 from bottom, for 29 read: 30. Genus.

„ 9 from bottom, for 30 read: 31. Genus.

P. 30 line 1 for 31 read: 32. Genus.

„ 20 at the end of *fimbrialis* add: ab. **moskovita** Gmpbg. „Fringes not variegated, ferruginous, at the base whitish“. — ab. **obsoleta** Skala. White lines above almost obsolete, beneath indistinct. — **magnata** Fuchs is a large form from Transcaspiæ, with more elongate, less strongly angled wings and weakly marked fringes.

P. 30 line 24 at the end of the genus **Thalera** add: **T. prouti** Th.-Mieg is unknown to me. ♂ expanse 25 mm or rather more (in set specimens), colour similar to that of *fimbrialis*, scaling rather thin. Forewing with costa white, tinged with rosy, and dotted with brick-red, an indistinct row of white vein-dots about 4 mm. from distal margin; terminal line brick-red, dotted with white on the veins; fringe white proximally, brick-red distally. Hindwing with the excision between the radials weak; distal margin and fringes as on forewing. Syria: Akbès.

P. 30 line 25 for 32 read: 33. Genus.

P. 31 line 8 to **dijuncta** Walk. add: (= *inoptaria* Walk., *claripennis* Btlr.)

„ 10 from bottom, to **dispartita** Walk. delete (2 h).

P. 32 line 5 for 33 read: 34. Genus.

„ 11 from bottom, for 34 read: 35. Genus.

P. 33 line 19 for 35 read: 36. Genus.

„ 24 from bottom, for 36 read: 37. Genus.

P. 34 line 9 for 37 read: 38. Genus.

„ 21 to **X. olympiaria** H.-Sch. add: (= *pallida* Warr.). WARREN's type, although faded, is green, not whitish as in ab. *cremonaria*.

P. 41 line 5 to *rhoda* subsp. nov., for (7 a) read: (7 e).

„ 14 to *R. poliaria* Hmps., for (1 a) read: (7 a).

P. 42 line 3 to *R. cuprinaria* Chr., for (= *phoenicearia* Hmps.) (1 a) read: (= *phaenicearia* Hmps.) (7 a).

P. 43 line 21 delete *sinensis* subsp. nov., which sinks to *bisinuata* Warr.

„ 11 from bottom, to **R. bisinuata** Warr. add: (= *sinensis* Prout). WARREN's locality „Japan“ is erroneous, the species is only known from Central and W. China.

P. 44 line 22 to *T. orientis*, for (1 a) read: (7 a).

P. 45 line 21 at end of *Somatina* add: Sect. B. Antenna of ♂ with less short pectinations (*Orthoserica* Warr.).

S. mirandaria Leech (25 a). Described as *Boarmia*! Probably a form of *rufigrisea* Warr., from the Khasia Hills, rather smaller, paler and duller, the grey subbasal and costal markings more extended, all confluent. Ichang in June, only the type known.

P. 45 line 22 from bottom, to *C. persimilis* Moore. for (1 a) read: (7 a)

„ 3 from bottom, for „ae“ read: „are“.

P. 48 line 10 after 5 f add: as *amataria*.

„ 26 for **grisearia** Petersen read: **griseata** Petersen (also in the margin, and in line 25 from bottom).

line 25 from bottom, for temperature read: temperature.

- P. 48 line 24 from bottom, to *T. convectaria* Walk., for (1 a) read: (7 e).
 „ 19 from bottom, to *T. correspondens* Hmps., for (1 a) read: (7 e).
- P. 52 bottom line, to the footnote add: p. 80, 4 m.
- P. 53 line 18 from bottom, to **gastonaria** Oberth. add: (= *obscuraria* Bang-H.). BANG-HAAS has mistaken the form *candicans* for the name-type.
- P. 54 line 13 for tinr read: tiny.
- P. 57 line 24 at end of *immorata* add: ab. **albofasciata** Rbl. White stripes wanting except a relatively broad one (1 mm) in the middle; subterminal white spots normal. — ab. **luctuata** Rbl. Black except the subterminal spots. — ab. **bistrigata** Galvagni. Median area of both wings with 2 sharply prominent, approximated blackish stripes the outer projecting distally in small streaks along the veins. — ab. **unistrigata** Galvagni. Similar to *bistrigata*, but with only the outer of the two stripes.
- P. 59 line 27 for „than“ read: „them“.
- P. 62 line 8 after ab. **infuscata**, delete the words: I will take drawing from *H.-Sch.*
- P. 67 line 12 for **Wallengreen** read: **Wallengren**.
- P. 69 line 29 from bottom, as further synonym to *subpunctaria* add: (? = *maritimaria* Brd.)
- P. 70 line 14 to *A. caricaria* Reutti, for (3 k) read: (4 k).
 „ 23 from bottom, for „hindtarsus less than half“ read: „hindtarsus rather more than half.“
 „ 17 from bottom, for „in the from“ read: „in the form“.
- P. 74 line 15 from bottom, at the and of *nigropunctata* add: ab. **catenaria** Brd. has the dark irroration and distal lines intensified.
- P. 75 line 28 for „some“ read: „same“.
- P. 83 line 18 after *fucata* add: (3 l).
- P. 85 line 8 after *G. isibellaria*, introduce: **G. romanarioides** Rthschd. Rather narrower winged than *rommaria*, the dark dusting not arranged in fine transverse strigulation, antemedian line not excurved behind the cell, postmedian less excurved near the costa, terminal black dashes more nearly joined into a single line, less thickened in the middle of the interspaces, pale line at base of fringe much less prominent. S. Algeria in April.
- P. 88 line 12 after *plumularia* add: (7 c).
 „ 17 from bottom, for „in this form in“ read: „in this form is“.
 „ 13 form bottom, after „distinct“ add: „The type is in my collection“.
- P. 89 line 17 after *C. filacearia* insert: **C. (?) luteofasciata** Rthschd. Systematic position entirely doubtful; I have only seen the ♀. Forewing with areole open, hindwing with 2nd subcostal very shortly stalked or from a point. Wings glossy white, somewhat recalling *gastonaria candicans*, forewing with a single narrow, bright golden-brown band parallel with the distal margin, hindwing unmarked. Length of a forewing in ♂ 7.5, in ♀ 10 mm. S. Algeria, in June.
- P. 90 bottom line add: occurs also in Algeria.
- P. 94 line 5 for „abont“ read: „about“.
 „ 6 for Guilhemle read: Guilhem-le.
- P. 99 line 5 from bottom, after the form *roseata*, insert: ab. **subfuscaria** (Rbl.) *Schawerda* is darker brown with darker markings. Bosnia.
- P. 106 line 11 from bottom, after *libycata*, introduce: **Pt. vilaflorensis** Rbl. Smaller than *libycata*, with narrower, more elongate wings, darker, more reddish yellow colour, smaller black dots in the fringes, darker face and different ♂ antenna, the joints projecting much less at their extremities and bearing shorter fascicles of cilia. Teneriffe: Vilaflor.
- P. 113 line 19 at the end of *seriata* add: ab. **hauderi** Kautz has the same ground-colour as the other southern forms, but is more strongly and evenly grey-dusted, the dark lines wanting, the light subterminal distinct.
- P. 120 line 5 from bottom, to *incarnaria* add: occurs also in Switzerland.
- P. 121 line 18 to *eugenista* add: occurs also in Algeria. — ab. **jacobsi** Prout. Forewing with a moderately distinct dark central band, recalling that of *degeneraria*. Gibraltar.
- P. 122 line 24 from bottom, after 3 h insert: as *oenopararia*.
- P. 123 line 1 after 4 e insert: as *circuitata*.

P. 123 line 25 from bottom, for „ont“ read „out“.

P. 124 line 23 from bottom, between *herbariata* and *fimbriata* introduce: **Pt. sordida** *Rthschd.* appears to be related to *herbariata* but very dark, the lines almost lost in a rather uniform coarse fuscous speckling; '5 are traceable on forewing, 3 on hindwing, discal mark on hindwing distinct. 2nd subcostal of hindwing very long stalked with 1st radial. S. Algeria.

P. 125 line 24 from bottom, for *intermediata* read: *intermediate*.

P. 126 line 18 to *pecharia* add: (4 f).

P. 127 line 13 for *extinacta* read: *extincta*.

P. 128 line 13 to *perpulverea*, for (7 b) read (5 e).

P. 129 line 11 after 3 i insert: as *amoenaria*.

P. 131 line 7 from bottom, for *although* read: *although*.

P. 132 line 14 from bottom, to *lutulentaria* add: **aurata** *Mendes*, from S. Fiel, Portugal, is rather larger and brighter gold-yellow than the name-typical, Spanish form, the lines rather paler.

P. 133 line 18 after 4 f insert: misprinted *fusciovenosa*.

P. 135 line 12 from bottom, for **bilinenaria** *Fuchs* read: **bilinaria** (also in margin).

P. 138 line 19 from bottom, at the end of *aversata* add: ab. **latefasciata** *Vorbr. and Müll.-Rutz.* Dark band extended proximally so as to enclose the discal dot.

P. 140 line 25 at the end of *Ptychopoda* add: **Pt. microptera** *Warr.* Very small, very narrow, glossy bone-colour with coarse dark irroration, a sinuous dark central line on the forewing standing out strongly and a dark cell-dot at about two-thirds; hindwing with cell-dot and faint lines. — ab. **granulosa** *Warr.* is more regularly dusted, thus appearing darker grey, the cell-dots wanting. Sudan and Heliopolis (Egypt); ? Biskra.

P. 146 line 23 to *calaritana* add: ab. **badiaria** *Trti.* corresponds to the *puppillaria* aberration of the same name. — ab. **nolaria** *Trti.* corresponds to *puppillaria* ab. *nolaria*.

„ 24 for *punctaria Schiff.* read: *punctaria Hbn.*

P. 151 line 22 from bottom, for var. read: ab.

P. 152 line 5 for p. 151 read: p. 128.

P. 154 line 29 from bottom, for **anthophilaria** read: **antophilaria** (also line 23 from bottom and line 14 from bottom).

P. 155 line 15 at the close of *antophiluria* add: Egg elliptical, yellow, later red. Newly hatched larva light reddish, with broad red-brown subdorsal stripe. After 1st moult very variable in colour, bluish or greenish to light grey or brownish, always with broad light, dark-bordered dorsal stripe; head relatively large. On flowers of *Statice gmelini* (BARTEL, Mitt. Münch. Ent. Ges., Jahrg. 5, p. 22).

P. 156 line 5 from bottom for *occidental* read: „accidental“.

P. 160 line 21 from bottom, for **magna form. nov.** read: **chouika Oberth.**

P. 161 line 9 from bottom, for *simularia* read: *similaria*.

P. 164 line 7 to *bipunctaria* add: **pallidata** *Vorbr. and Müll.-Rutz.* The pale, whitish chalk-form has recently been thus named.

P. 172 line 25 after 6 e insert: as *flavicornuta*.

„ 22 from bottom, for „bearing“ read: „bearing“.

„ 8 from bottom, at the end of *griseata* add: ab. **brunnescens** *Skala* is light grey-brown instead of pale-grey.

P. 174 line 16 from bottom, to *distinctata*, instead of (12 a) read: (13 e).

P. 175 line 12 *L. marmorata*, delete the whole account here. Compare p. 397.

P. 176 bottom line, after *A. poneformata* introduce: **A. bohatschi** *Püng.* is also similar to *praeformata* but much smaller, without red admixture, the anterior part of the line in the basal area and of the antemedian band not so deep black, the postmedian band sharper, strongly bent near the costa, the double subterminal line distinct. Andalusia.

P. 177 line 4 after *tangens* insert: (= *conjuncta Krausse*).

„ 11 for *confluens* read: *conflua*.

P. 178 line 1 to *fraternata*, delete (12 a).

- P. 178 line 5 after 11 b insert: as *obritaria*.
- P. 184 line 7 from bottom, after *terranea*, delete (12 c).
- P. 191 line 7 from bottom, for *L. fasciaria* *Leech* read:
- L. pallida** *Warr.* (= *fasciaria* *Leech*), founded on a worn ♀ said to be from Japan.
- P. 191 bottom line add: Central China.
- P. 198 line 7 from bottom, for „liue“ read: „line“.
- „ 3 from bottom, after 13 a insert: as *saseriata*.
- P. 199 line 3 to *multilinearis* add: (13 d).
- P. 199 line 19 to *confusaria* add: (13 c).
- „ 26 to *sideritaria* delete (13 b).
- P. 205 line 18 from bottom, for *rhamnata* read: *transversata*.
- P. 206 line 3 from bottom, for (13 b) read: (13 n).
- P. 211 line 17 after *silacea* insert a comma.
- P. 212 line 1 to ab. *rufescens* add: (= *intermedia* *Schawerda*).
- P. 215 line 18 for „whitly“ read: „wholly“.
- P. 216 line 8 from bottom add to *C. variata*: ab. **interrupta** *Schawerda* has the median band interrupted.
- P. 219 line 18 from bottom, after 8 i insert: as *serrata*.
- P. 220 line 8 to *phaiosata* add: According to THIERRY-MIEG this sinks to *pendearia* (p. 232). Probably STAUDINGER was in error regarding the ♂ genitalia.
- P. 220 line 9 from bottom, to *planifasciata*, for (13 c) read: 13 d).
- P. 226 line 23 to *ignobilis* add: (11 i).
- P. 232 line 24 to *pendearia* delete (12 d).
- P. 233 line 17 from bottom, for „relationshig“ read: „relationship“.
- „ 16 from bottom, to *nitidaria* add: (13 n).
- „ 8 from bottom, to *rotundaria* add: (13 n).
- P. 236 line 28 from bottom, for „stotu“ read: „stout“.
- P. 237 line 1 *poliotaria*, for (13) read: (13 n).
- „ 1 from bottom, after 7 i insert: as *rigrifuscaria*.
- P. 238 line 1 after 13 a insert: as *ramataria*.
- P. 240 line 22 *reclamata*, for (13 c) read: (13 b).
- P. 242 line 21 to *perplexata* add: (7 i as *perplexaria*).
- „ 24 *casearia* for (13 c) read: (13 h).
- P. 248 line 18 from bottom, to *molluginata* add: ab. **constricta** *Wehrli* has the median band of the forewing constricted.
- P. 249 line 16 from bottom, *centrostrigaria*, after 13 b insert: as *centrosignaria*.
- P. 263 line 10 to ab. *tricolorata* add as further synonym: (= *leucotaenia* *Schawerda*).
- P. 272 line 28 *nymphulata*, for (13 f) read: (13 g).
- „ 7 from bottom, after 13 g insert: as *tschrachiaria*.
- P. 275 line 25 from bottom, *homogrammata* add: (25 h).
- „ 3 from bottom, after 13 f insert: as *spissilinearis*.
- P. 277 line 2 after *illuminata* insert: (25 e).
- P. 278 line 14 to *valerianata* add: **laevilignata** *Brd.*, from Doubs, is said to be extremely like *valerianata* but more fulvous, perhaps only a form of it. Probably not identifiable.
- P. 278 line 3 from bottom, *variostrigata* delete (13 f).
- P. 279 line 26 from bottom, to *carpophagata* add: (25 e).
- „ 19 from bottom, to *teriolensis* add: (13 k).
- P. 280 line 14 *silenicolata* after 12 m insert: as *sileniculata*.
- „ 19 from bottom, to *terrenata* add: (25 h).

- P. 281 line 12 from bottom, *syriacata* add: (25 f).
P. 282 line 25 for *pumbeolata* read: *plumbeolata*.
P. 286 line 26 from bottom, *carearia* for (13 h) read: (13 e).
P. 287 line 25 *biornata* add: (13 m).
,, 13 from bottom, *bohatschi* add: (25 f).
P. 288 line 11 from bottom, *nephelata* add: (25 f).
P. 289 line 12 *orphanata* add: (25 e).
P. 290 line 3 *druentiata* add: (25 e, as *tricendaria*).
,, 17 from bottom, *moecha* add: (25 e).
P. 291 line 1 *rubellata* add: (25 e).
P. 293 line 7 *assectata* add: (13 b).
,, 10 *extensaria* for (13 g) read: (13 i, as *prolongata*).
,, 15 *sydya* add: (25 f, as *sytya*).
,, 22 *rebeli* add: (13 i).
P. 294 line 28 *costisignata* add: (25 e).
,, 16 from bottom, *mitigata* add: (25 f).
P. 295 line 6 from bottom, *graciliata* add: (25 e).
P. 296 line 9 *graeseriata* add: (12 m).
,, 24 from bottom, *phoeniceata* read: (12 l, 13 o).
P. 297 line 8 from bottom, after „lighter“ insert a comma.
P. 298 line 12 from bottom, to *coronata* add: ab. ***lanceolata*** *Vorbr. and Müll.-Rutz* has a blackish longitudinal streak from the antemedian line to the V-shaped projection of the postmedian.
,, 6 from bottom, for **N. consueta** read: **C. consueta**.
P. 299 line 10 ab. *nigrosericeata* add: (12 m).
P. 300 line 12 *flavovenata* add: (11 i).
,, 16 *minuta* add: (7 f).
P. 301 line 8 for „blackisch“ read: „blackish“.
,, 13 from bottom, after „which“ insert: „extend“.
P. 302 line 11 for „medial“ read: „median“.
,, 15 to *plurilineata* add: (7 f).
,, 23 to *aemulata* add: (25 a).
bottom line for „slendery“ read: „slenderly“.
P. 303 line 4 for „put“ read: „but“.
,, 18 for „tough“ read: „though“.
,, 19 for „typical“ read: „tropical“.
,, 22 for „longescaled“ read: „long-scaled“.
P. 304 line 4 for „indefinitely“ read: „indefinitely“.
,, 20 from bottom, after 23 a insert: misprinted *bartheli*.
,, 12 from bottom, for „deffinite“ read: „definite“; for „suffusian“: „sutrusion“.
P. 307 line 3 for „narrow-winged“ read: „narrower-winged“.
P. 309 line 23 for „sinous“ read: „sinuous“.
P. 312 line 11 for „Shangai“ read: „Shanghai“.
,, 8 from bottom, for HUBNER's read: HÜBNER's.
P. 315 line 15 from bottom, for **O. incertaria** read: **C. incertaria**.
P. 317 line 14 from bottom, for „Shangai“ read: „Shanghai“.
P. 320 line 12 for „surface“ read: „surfaces“.
P. 321 line 12 for „perphas“ read: „perhaps“.
,, 6 from bottom, for „Indo-Australien“ read: „Indo-Australian“.

- P. 322 line 3 for „wit“ read: „with“.
- P. 323 line 1 for **O. margaritata** read: **C. margaritata**; after 15 i insert: as *murguritaria*.
 „ 7 for „Nill.“ read: „Vill.“
 „ 22 for „netword“ read: „network“.
 „ 24 from bottom, for „larve“ read: „larva“.
- P. 324 line 15 from bottom, for „Palestina“ read: „Palestine“.
- P. 325 line 3 after Arctic, delete the comma.
 „ 26 for „black-marken“ read: „black-marked“.
- P. 326 line 3 from bottom, to *fenestratus* read: (16 b, as *specularis*).
- P. 327 line 20 for „elongata“ read: „elongate“.
- P. 328 line 13 for „1st an 2nd“ read: „1st and 2nd“.
 „ 22 from bottom, for „described as from Korea“ read: „described from Korea as“.
- P. 330 line 3 for „femors“ read: „femora“.
 „ 10 to *rufescentaria* the citation of the plates should run: „(16 d; 16 e as *consociaria*)“.
 „ 19, for „Chungkung“ read: „Chungking“.
 „ 7 from bottom, after „middle“ add a comma.
- P. 331 line 22 from bottom, for „Mst.“ read: „Ms.“
- P. 332 line 12 for „red-browu“ read: „red-brown“.
- P. 334 line 20 from bottom, for „simpel“ read: „simple“.
 „ 9 from bottom, for W. „India“ read: S. „India“.
- P. 335 line 3 for „thicken“ read: „thicker“.
 „ 22 for „tingend“ read: „tinged“.
 „ 24 for „elevatoin“ read: „elevation“.
 „ 25 for „stringulated“ read: „strigulated“.
- P. 336 line 14 *parallelaria* for (17 a) read: (17 d).
 „ 15 after „species“ insert a comma.
- P. 337 line 22 from bottom, for „HAMPSPON“ read: „HAMPSON“.
 „ 5 from bottom, for „defined an ill“ read: „an ill-defined“.
- P. 338 line 6 from bottom, *latifasciaria*, after 17 h insert: as *latefasciaria*.
- P. 339 line 23 for „4th and 5 th“ read: „4th and 5 th segments“.
 „ 3 from bottom, *sulphurea* for (17 h) read: (17 i).
- P. 340 line 16 from bottom, after 17 i insert: as *phoenicotaeniata*.
- P. 341 line 10 for „violett-grey“ read: „violet-grey“.
- P. 344 line 21 from bottom, after 18 d insert: as *roesslerstammaria*.
- P. 345 line 15 for *Eilicrinaria* read: *Eilicrinia*.
- P. 347 line 16 for *trexleri* read: **trexleri** (thick type) and add the name in the margin.
 „ 22 for „Grece“ read: „Greece“.
- P. 350 line 27 for „*falcigere* Btlr. (III. Lep.)“ read: „*falcigera* Btlr. (III. Lep.)“.
- P. 351 line 16 from bottom, for „(19 as)“ read: „(19 a, as *buraetaria*)“.
- P. 352 line 23 for **fasciata** read: **fasciaria**.
 „ 6 from bottom, ab. *holmgreni*, for (18 k) read: (18 l).
- P. 356 line 18 from bottom, after 19 e insert: as *hannoviensis*.
 „ 15 from bottom, for „micropylar and“ read: „micropylar end“.
- P. 358 line 4 after „green“ insert a comma.
 „ 25 from bottom, for „call“ read: „cell“.
 „ 12 from bottom, for „definete“ read: „definite“.
- P. 359 line 23 from bottom, read: „(perhaps even the same)“.
 „ 22 from bottom, for „2rd“ read: „2nd“.

- P. 300 line 21 for *serrata* read: *sarrate*.
- P. 361 line 9 for „binectinata“ read: „bipectinate“.
 „ 17 after 24 b add: as *scotosaria*.
- P. 362 line 24 for „Dalmation“ read: „Dalmatian“.
- P. 363 line 16 from bottom, for „Ussusi“ read: „Ussuri“.
- P. 364 line 4 for „loss“ read: „less“.
- P. 365 line 8 delete the last 11 words.
- P. 367 line 13 for „brownisch“ read: „brownish“.
 „ 18 from bottom, for „lamelles“ read: „lamellae“.
- P. 368 line 7 for „the appearing“ read: „thus appearing“.
 „ 5 from bottom, for „licaria“ read: „ilicaria“.
- P. 369 line 1 for **basifasciaria** read: *basifuscaria*; the name given on the plate must therefore stand.
- P. 370 line 19 after 20 h insert: as *mandschuraria*.
- P. 372 line 10 for „blue-green“ read: „blue-grey“.
- P. 374 line 22 from bottom, for „*Gmbj.*“ read: „*Gmpbj.*“
 „ 17 from bottom, for „and“ read: „end“.
 „ 8 from bottom, for „*Gsoff.*“ read: „*Geoff.*“
 „ 5 from bottom, for „*Serrida*“ read: „*Serraca*“.
 „ 3 from bottom, for „the somewhat interrupted“ read: „the (somewhat interrupted)“.
- P. 375 line 18 for *fuscaria* read: *athleta*.
 „ 20 after 21 f insert: as *tschraparia*.
 „ 8 from bottom, for „excentric“ read: „eccentric“.
- P. 376 line 19 after 21 g insert: as *albosignata*.
- P. 377 line 15 for „spezies“ read: „species“.
 „ 24 from bottom, for „larva“ read „larvae“.
- P. 381 line 23 for „broadned“ read: „broadened“.
- P. 382 line 22 from bottom, for „pecularity“ read: „peculiarity“; after „which“ insert: „I“.
 „ 21 from bottom, for „lat-named“ read: „last-named“.
- P. 384 line 13 for „Antiocha“ read: „Antioch“.
- P. 386 line 6 for „as“ read: „a“.
- P. 388 line 1 for „sligth“ read: „slight“.
 „ 4 for „conferata“ read: „confertata“.
 „ 18 from bottom, for „as eparate“ read: „a separate“.
- P. 390 line 9 from bottom, for „stronger“ read: „strongly“.
 „ 4 from bottom, for „antenne“ read: „antenna“.
- P. 391 line 14 after „upperside“ insert a comma.
 „ 25 from bottom, for „forewing“ read: „foregoing“.
- P. 392 line 24 from bottom, for *Latascia* read: *Catascia*.
- P. 394 line 24 from bottom, for **P. tenebraria** read: **O. tenebraria**.
- P. 396 line 21 from bottom, after *homochromatx* delete „(25 h as *homogrammata*)“.
- P. 397 line 7 from bottom, for *Hbn.-Gev.* read: *Hbn.-Gey.*
- P. 398 line 11 from bottom, for „1 dt“ read: 1 st“.
- P. 400 line 14 after 23 g insert: as *dziurzynskaria*.
- P. 403 line 12 from bottom, for „*scutularia Dup.*“ read: „*convergata Vill.*“.
- P. 404 lines 1, 2 and 6 for *scutularia* read: *convergata*.
 „ 21 from bottom, for „**Ph. glarearia**“ read: „**Ch. glarearia**“.
- P. 405 line 6 for „imperfiata *Walk.*“ read: „imperviata *Walk.*“.
- P. 408 line 9 from bottom, to **D. tekkearia** add „*Christ.*“.

Appendix *).

33^{bis}. Genus: **Nothomiza** Warr.

Most characters as in *Ephoria*, to which MEYRICK sinks it. Face not protuberant. ♂ antenna not pectinate (though usually serrate), 1st and 4th discocellulars somewhat convergent, distal margins less rounded. Indo-Malayan Region to Japan and Formosa, only a few species.

A. Antenna in ♂ serrate (*Nothomiza*).

N. formosa Btlr. (15 i). Median area of forewing orange-reddish, proximal and distal areas violaceous grey, the colours not sharply defined. The costal spots, which characterize the typical section of the genus, are here large and pale yellow; a small apical yellow spot, usually divided by the 5th subcostal vein. Japan.

B. Antenna in ♂ thickened and flattened (*Caberodes* Hmps., nec *Guen.*).

N. achromaria *Guen.* Distal margin of forewing convex. Light grey, smoothly and not very thickly scaled, both wings with minute dark discal dot, lines whitish, slender, narrowly dark-edged in median area; antemedian straight; postmedian slightly bent near costa, then straight, slightly oblique, present also on hind-wing except at costa, placed near the discal dot. N. W. Himalayas (Dharmasala, etc.).

N. simpliciaris *Leech* (as *Euchloris*). Green with minute discal dots and very slender rustcoloured terminal line, forming a spot at apex of fringe of forewing. Chang Yang. Probably a form of *viridis* Warr., from India.

*) This appendix has not been added in the German edition.

Corrections to the Plates in Volume 4.

Pl.		1. Fig.	for	membranaria	read:	tenuis
3 a	2.	"	"	tenuis	"	punctigera
3 d	7.	"	"	badiaria	"	praeacisaria
3 d	8.	"	"	praeacisaria	"	badiaria
3 f	8.	"	"	abyssumata	"	alyssumata
3 g	3.	"	"	marcolensis	"	mareotica
3 g	10.	"	"	extraordinaria	"	donovani
3 h	4.	"	"	invalidaria	"	invalida
3 h	10.	"	"	oenopararia	"	oenoparia
3 i	6.	"	"	amoenaria	"	terpnaria
3 i	11.	"	"	erschoffiata	"	erschoffi
3 k	5.	"	"	tabiascaria	"	tabianaria
3 k	6.	"	"	adelphata	"	adelpharia
3 l	3.	"	"	confinaria	"	saccharia
3 m	1.	"	"	walkerii	"	rufigrisea
3 m	3.	"	"	sedataria	"	leuvaria
3 m	7.	"	"	pulveraria	"	coniaria
4 a	5.	"	"	vittaria	"	transiens
4 a	6.	"	"	filacearia	"	exilaria
4 c	8.	"	"	contiguaria	"	eburnata
4 c	9.	"	"	consolidata	"	submutata
4 d	3.	"	"	cubicularia	"	obscura
4 d	9.	"	"	straminata	"	sylvestraria
4 d	11.	"	"	extarsaria	"	eriopodata
4 d	12.	"	"	eriopodata	"	extarsaria
4 e	9.	"	"	circuitata	"	circuitaria
4 f	10.	"	"	fusciovenosa	"	fuscovenosa
4 h	5.	"	"	beckeraria	"	rubellata
4 h	9.	"	"	luridata	"	diffinaria
4 i	2.	"	"	coenosaria	"	confinaria-♀
4 i	7.	"	"	frigidaria	"	sentinaria
4 m	3.	"	may be an aberration of <i>Ac. superior</i> .			
4 m	4.	"	may be <i>Ac. invalida</i> .			
4 m	5.	"	is <i>Ac. ignobilis</i> .			
4 m	6.	"	is <i>Ac. nupta</i> .			
4 n	3.	"	is <i>Ac. superciliata</i> .			
5 e	3.	"	for	privata	read:	privataria
5 e	4.	"	"	subpunctaria	"	suppunctaria
5 f	9.	"	"	amalaria	"	amata
6 e	6.	"	"	kindermannii	"	exsecuta
6 e	2.	"	"	duplicata	"	coassata
6 e	4.	"	"	flavicornuta	"	flavicornata
6 f	6.	"	"	polycomata	"	polycommata
6 g	6.	"	"	consobrinaria	"	viretata
6 k	4.	"	"	boisduvaliata	"	annexata
6 l	4.	"	"	bicolor	"	tonchignearia
7 a	9.	"	"	albiceraria	"	infusata
7 g	2.	"	"	plicataria	"	dharmae
7 i	1.	"	"	nigrifuscaria	"	nigrifasciaria
7 k	7.	"	"	costaria	"	castaria
7 l	6.	"	"	subochreata	"	subochraria
8 b	3.	"	"	kioudrouaria	"	kioudjrouaria
8 b	6.	"	"	naparia	"	indistincta
8 c	8.	"	"	vetulina	"	velutina
8 d	3.	"	"	exultata	"	excultata
8 e	7.	"	"	testata	"	acatinata
8 h	4.	"	"	scotica	"	obliterata
8 i	2.	"	"	serrata	"	serraria
9 g	2.	"	"	ravaria	"	subravaria
9 g	3.	"	"	flavocinctaria	"	flavicinctata
9 i	7.	"	"	tonchignearia	"	tonchignearia
9 i	5.	"	"	internata	"	intersecta
10 a	2.	"	"	alpicolaria	"	obsoletaria
10 a	4.	"	"	putridaria ♀	"	permixtaria
10 a	5.	"	"	permixtaria	"	bulgariata
10 a	6.	"	"	unicata	"	corollaria

Pl.		3. Fig.	for	procellaria	read:	procellata
10 c	6.	"	"	junerata	"	pupillata
10 h	2.	"	"	obliterata	"	nebulata
10 h	3.	"	"	luteata	"	flammeolaria
10 i	8.	"	"	adjouaria	"	stellata
10 l	1.	"	"	deflavata	"	umbrosaria
10 l	2.	"	"	silaceata	"	insulata
10 l	4.	"	"	mactaria	"	mactata
10 l	5.	"	"	chrysoprasia	"	fissisignis
10 l	6.	"	"	aurata	"	aliena
11 a	6.	"	"	oberthuri	"	oberthuri
11 b	6.	"	"	bissurata	"	fissurata.
11 b	9.	"	"	obritaria	"	obsitaria
11 d	2.	"	"	pulveraria	"	pallescens
11 f	5.	"	"	obscura	"	subobscura
11 i	4.	"	"	nigrilineata	"	lanae
12 i	2.	"	"	cognata	"	dietzei
12 i	4.	"	"	ligusticata	"	cognata
12 m	8.	"	"	sileniculata	"	silenicolata
13 a	1.	"	"	ramataria	"	ramalaria
13 a	7.	"	"	seseiata	"	seseiaria
13 b	9.	"	"	centrosignaria	"	centrostrigata
13 d	8.	"	"	tschrinaria	"	tchrinaria
13 f	2.	"	"	spissilinearia	"	spissilineata
13 g	11.	"	"	tschrackiaria	"	tchrackiaria
13 i	5.	"	"	prolongata	"	extensaia
13 k	1.	"	"	togata	"	pini
14 g	2.	"	"	gigantaria	"	gigantearia
15 d	6.	"	"	adustaria	"	adustata
15 e	4.	"	"	bipunctata	"	subnotata
15 e	8.	"	"	platyleucaria	"	platyleucata
15 g	2.3	"	"	pusata	"	pusaria
16 b	9.	"	"	specularis	"	fenestratus
16 d	5.	"	"	evonymaria	"	flavescens
16 d	7.	"	"	sulphurea	"	cesadaria
16 e	2.	"	"	consociaria	"	rufescentaria
16 e	4.	"	"	albinotaria	"	albonotaria
17 f	2.	"	"	cretacea	"	cretea
17 h	3.	"	"	latefasciaria	"	latifasciaria
18 b	6.7	"	"	advenaria	"	pluviaria
18 c	7.	"	"	coreata	"	corearia
18 d	1.	"	"	himalaica	"	himalayica
18 d	5.	"	"	roesslerstammaria	"	roesslerstammaria
18 g	1.	"	"	alternata	"	alternaria
18 g	2.	"	"	signata	"	signaria
18 g	5.	"	"	aestivaria	"	aestimaria
18 g	6.	"	"	pluviata	"	hebesata
18 i	2.	"	"	richardi	"	richardsi
18 k	2.	"	"	marmorinaria	"	nigricaria
18 l	5.	"	"	consimilata	"	consimiliaria
19 a	6.	"	"	buraetaria	"	buraetica
19 e	3.	"	"	hannoviensis	"	hanoviensis
20 h	1.	"	"	mandschuraria	"	mandschuriaria
21 f	1.	"	"	tschraparia	"	tchraparia
21 g	3.	"	"	albosignata	"	albosignaria
22	Heading	"	"	Tephрина	"	Tephronia
22 c	3. Fig.	"	"	approximataria	"	approximaria
23 a	4.	"	"	bartheli	"	barteli
23 e	7.8	"	"	plumistraria	"	plummistaria
23 g	2.	"	"	dziurzinskaria	"	dziurzinskii
25 e	1.	"	"	pumicaria	"	graciliaria
25 e	6.	"	"	trientata	"	druentiata
25 f	5.	"	"	aurita	"	amita
25 f	7.	"	"	sytya	"	sydyi
25 i	5.	"	"	griseolaria	"	grisolaria
25 l	2.	"	"	boeticaria	"	baeticaria

Alphabetical List

of the forms of the Palearctic Geometrae with references to the original descriptions.

* signifies that the form is figured at the place quoted.

abafii Cid. *Prt.* Seitz, Groß-Schmett. 4, p. 253.
 abafii Lithost. *Uhryk*, Rovart. Lap. 5, p. 7.
 abbreviata Eup. *Steph.* Brit. Insect. 2, p. 144.
 additaria Cid. *H.-Schäff.* Syst. Schmett. Eur. 6, p. 138. *
 abjecta Endr. *Btlr.* Ann. Mag. Nat. Hist. (5) 4, p. 371.
 ablataria Cab. *Fuchs* Jahrb. Nass. Ver. Naturk. 52, p. 144.
 ablunata Sten. *Guen.* Spec. Gén. Léop. Phal. 1, p. 110.
 ablutaria Cid. *Bsd.* Gén. Ind. meth. p. 203.
 abmarginata Ptych. *Bhtsch.* Wien. Ent. Zschr. 1885, p. 145.
 abraxaria Cid. *H.-Schäff.* Syst. Schmett. Eur. 6, p. 137. *
 abraxaria Neol. *Alph.* Rom. Mém. Léop. 6, p. 72. *
 abraxina Cid. *Btlr.* Ann. Mag. Nat. Hist. (5) 4, p. 443.
 abruptaria Hem. *Thnbg.* Dissert. Entom. 4, p. 59. *
 absinthiata Eup. *Cl.* Icon. Ins. rar. *
 abstersaria Bo. *Bsd.* Gén. Ind. meth. p. 197.
 abstersata Cid. *H.-Schäff.* Syst. Schmett. Eur. 3, p. 153. *
 abstinentaria Lythr. *Fuchs*, Stett. Zg. 62, p. 377.
 acardia Eil. *Stich.* Zeitschr. Wiss. Insect.-Biol. 1911, p. 162. *
 accentuata Disc. *Prt.* Seitz, Groß-Schmett. 4, p. 270.
 accessaria Acid. *H.-Schäff.* Syst. Schmett. Eur. 6, p. 64. *
 accipitraria Gn. *Guen.* Spec. Gén. Léop. Phal. 1, p. 300.
 accurata Eup. *Stgr.* Iris 1892, p. 251.
 accurataria Acid. *Christ* Bull. Soc. Moscou 1880 (2), p. 47.
 aceris Alsoph. *Dup.* Hist. Nat. Leg. 7 (2). *
 achatinata Lygr. *Hbn.* Smmlg. Eur. Schmett. Geom. *
 achatinellaria Lygr. *Oberth.* Ét. d'Ent. 5, p. 57. *
 achrolopha Photosc. *Püng.* Iris 12, p. 299. *
 achromaria Cid. *Lah.* Faun. Suisse Geom. p. 128. *
 acidaria Rhodostr. *Stgr.* Iris 5, p. 204.
 actaeata Eup. *Walderdorff*, Corrb. Zool.-Min. Ver. Regensb. 1869, p. 82.
 acuminaria Asp. *Ev.* Bull. Soc. Mosc. 1851, p. 636.
 acuminaria Phal. *Leech*, Ann. Mag. Nat. Hist. 19 (1897) p. 222.
 acutangulata Cid. *Christ* Rom. Mém. Léop. 3, p. 3. *
 acutaria Crasp. *Leech*, Ann. Mag. Nat. Hist. (1897) p. 19.
 acutaria Dal. *Leech*, Ann. Mag. Nat. Hist. 19 (1897), p. 217.
 acutaria Gon. *Leech*, Ann. Mag. Nat. Hist. 19 (1897), p. 221.
 adauctata Rhodostr. *Stgr.* Iris 5, p. 160.
 addictata Eup. *Dietze*, Iris 1908, p. 194.
 adelpharia Acid. *Püng.* Stett. Zg. 1894, p. 76.
 adherbatiata Ptych. *Stgr.* Iris 10, p. 306.
 adjectaria Gn. *Stgr.* Iris 10, p. 312. *
 adjunctaria Acid. *Bsd.* Gén. Ind. meth. p. 225.
 adjunctata Eup. *Dietze*, Iris 1903, p. 344.
 adlata Cid. *Stgr.* Iris 7, p. 294.
 admirabilis Jot. *Oberth.* Bull. Soc. Ent. Fr. (6) 3, p. 84.
 admissaria Bo. *Guen.* Spec. Gén. Léop. Phal. 1, p. 239.
 adonidaria Our. *Oberth.* Ét. Comp. Léop. 6. *
 adornata Orthol. *Stgr.* Iris 8, p. 334.
 adscriptaria Eup. *Stgr.* Cat. Lep. Eur. (II) p. 200.
 adulteraria Acid. *Ersch.* Fedtsch. Reise, p. 60. *
 adumbraria Cid. *H.-Schäff.* Syst. Schmett. Eur. 6, p. 79. *
 adustaria Ochod. *Fisch.* Wald. Bull. Soc. Moscou 1880, p. 88.
 adustaria Sel. *Leech*, Entomolog. 1891, Suppl. p. 42.
 adustata Ligd. *Schiff.* Wien. Verz. p. 114.
 advenaria Cepp. *Hbn.* Beytr. Gesch. Ins. 2. *
 advolata Microl. *Ev.* Bull. Soc. Moscou 10 (2), p. 51.
 aegyptiaca Eup. *Dietze*, Biolog. Eupith. I. *
 aemulata Hor. *Hbn.* Smmlg. Eur. Schmett. Geom. *
 aequata Acid. *Stgr.* Hor. Entom. Ross. 14, p. 440.
 aequata Eup. *Stgr.* Iris 5, p. 256.
 aequestriga Ist. *Hirschke*, Verh. Zool.-Bot. Ges. Wien 60, p. 416.
 aequifasciata Acid. *Christ* Bull. Soc. Moscou 1880 (2), p. 45.
 aequilinearia Sarc. *Wkr.* Cat. Lep. Het. Br. Mus. 21, p. 292.
 aequilineata Anaët. *Wkr.* Cat. Lep. Het. Br. Mus. 26, p. 1632.
 aequistrigata Eup. *Stgr.* Cat. Lep. Eur. (II), p. 194.
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 aeresa Eustr. *Btlr.* Ann. Mag. Nat. Hist. (5) 1, p. 451.
 aescularia Alsoph. *Schiff.* Wien. Verz. p. 102.
 aestimaria Mac. *Hbn.* Smmlg. Eur. Schmett. Geom. *
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aestiva Cos. *Fuchs*, Jahrb. Nass. Ver. Nat. 46, p. 98.
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 aestiva Ell. *Rbl.* Ann. Wien. Hofmus. 18, p. 624.
 aestiva Eup. *Dietze*, Biolog. Eupith. p. 125. *
 aestiva Sel. *Stgr.* Cat. Lep. Eur. (II) p. 157.
 aestivaria Hemith. *Hbn.* Beytr. Gesch. Schmett. 1 (4), p. 22. *
 aetheriata Par. *Graes.* Berl. Ent. Zschr. 1888, p. 391.
 aexaria Ang. *Wkr.* Cat. Lep. Het. Br. Mus. 20, p. 261.
 affinis Cid. *Moore*, Lep. Atkins, p. 277.
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 affinitata Ptych. *B.-Haas*, Iris 20, p. 82.
 agaritharia Enc. *Dard.* Ann. Soc. Ent. Fr. 1842, p. 201. *
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 agitata Xand. *Btlr.* Ann. Mag. Nat. Hist. (5) 1, p. 396.
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 aggregata Eup. *Guen.* Spec. Gén. Léop. Phal. 2, p. 315.
 agrestaria Pseudot. *Dup.* Hist. Nat. Léop. 7 (2), p. 257. *
 agrionides Vith. *Btlr.* Ann. Mag. Nat. Hist. (4) 15, p. 137.
 agrostemmata Ptych. *Guen.* Spec. Gén. Léop. Phal. 1, p. 512.
 alaudaria Cid. *Frr.* Beytr. 6, p. 11. *
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 alba Atom. *D.-Luc.* Ann. Soc. Ent. Fr. 79, p. 488. *
 alba Bo. *Gaucl.* Ent. Nachr. 24, p. 371.
 alba Hipp. *Gillm.* Societ. Entom. 24, p. 42.
 alba It. *Prt.* Seitz, Groß-Schmett. 4, p. 401.
 alba Ping. *Swinh.* Trans. Ent. Soc. Lond. 1891, p. 491. *
 albaria Asp. *Bartel*, Iris 15, p. 221.
 albaria Thal. *Esp.* Schmett. Abbild. 5 (10), p. 268. *
 albescens Bo. *Prt.* Seitz, Groß-Schmett. 4, p. 379.
 albescens Cid. *Rbl.* Berges Schmett.-Buch (IX) p. 355.
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 albicans Fid. *Oberth.* Ét. d'Ent. 20, p. 70.
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 albidaria Acid. *Stgr.* Cat. Pal. Lep. (III), p. 275.
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 albidaria Dysc. *Stgr.* Cat. Lep. Eur. (II), p. 173.
 albidaria Med. *Wkr.* Cat. Lep. Het. Br. Mus. 35, p. 1582.
 albidaria Rhodom. *Ersch.* Fedtschenkos Reise, p. 69.
 albidior Cid. *Alph.* Rom. Mém. Léop. 9, p. 344.
 albidulata Eup. *Stgr.* Iris 5, p. 54.
 albifera Bo. *Prt.* Seitz, Groß-Schmett. 4, p. 369.
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 albilinea Mark. *Th.* M. le Natural. 29, p. 260.
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 albiocellaria Cos. *Hbn.* Beytr. Gesch. Schmett. 1. *
 albiplaga Triph. *Oberth.* Ét. d'Ent. 11, p. 34. *
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 albonotaria Zeth. *Brem.* Lep. Ost-Sibir., p. 73. *
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 albosignata Fid. *Neubgr.* Societ. Entomol. 22, p. 2.
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 alchemillata Cid. *L.* Syst. Nat. (X), p. 526.
 alexandraria Cid. *Stgr.* Iris 5, p. 230.
 alexandraria Hier. *Prt.* Gen. Ins. 129, p. 205. *
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 alfacaria Orthol. *Stgr.* Stett. Zg. 1859, p. 219.
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 alniaria Enn. *L.* Syst. Nat. (X), p. 519.
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===== A systematic description =====
of the hitherto known Macrolepidoptera

edited in collaboration with well-known specialists

by

Dr. Adalbert Seitz, Professor

I. Section 4. Volume: The Palearctic Geometrae.
Plates.



STUTTGART

Verlag des Seitz'schen Werkes (Alfred Kernen)

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Preface.

While the fourth volume of the German edition could yet be completed in 1914 and 1915, the outbreak of the World's War prevented the communication of the publisher and editor with the author, and the English edition could only be brought to a finish after the resumption of the literary connection.

This volume concludes the first principal part of the Macrolepidoptera of the earth comprising the whole palaearctic range in which 15 444 species have been included, and a much greater number of which than in any of the previous volumes are to be looked upon as a reproduction of butterflies that have never before been represented in pictures. It was only by means of the water-colours painted in a thorough life-like style by Miss PROUT in the British Museum from the stock of the collections of LEECH, WILEMAN and others, that we were enabled to show pictorially many species of which only the type or very few specimens had been known hitherto.

With this volume the number of illustrations of the palaearctic part has been increased to 12 247, which are more by 2247 than we had in view at first, and held out in our prospectus. Of course, by reason of this extra performance, the number of parts, which was calculated to be fifteen, was also exceeded by five in this volume; yet, owing to the greater completeness offered in the illustrations, we hope to have raised the utility of the work and also to have deserved the indulgence requested for the limits of the last volume with respect to the elaboration of the Geometrides.

As to the text, which exceeds the initial program by ten sheets, we have, after exhaustive deliberations with the author, Mr. L. B. PROUT, above all taken the practical point of view into account, and abridged the diagnoses as much as possible with coloured species that cannot be mistaken in the pictures, while forms that are harder definable, as for instance the *Boarmia*, *Gnophos*, *Acidalia* etc, we have brought out in a more detailed way. On the other hand, with some species, as for instance *Medasina* and others, an illustration was not necessary in some isolated cases, when, according to specialists, coloured figures would not have rendered a material aid for their definition. Thus, for instance, with many *Eupithecia* of confused minute markings and great variation in the colouring, unenlarged pictures were declared to be valueless and even misleading, and for this very reason great and richly illustrated monographs of this kind have renounced such pictures. We, therefore, thought it more to the purpose to make use of the available space in such cases by the combination of easily recognisable distinctions in the description and scrupulous statement of biological and geographical details. We should like to point out that the irregularity in the treatment, devoting, for instance, to the variegated and in the figure sufficiently recognisable *Abraxines* 2 to 3, but to the more difficult distinguishable *Acidalias* and *Boarmias* 10 to 20 lines, is but a specious one, and that contrary to the restriction to what was necessary and indispensable consistency has been aimed at.

Only the elementary descriptive list, which has to be looked upon as an addition not provided for in the prospectus, was not yet completed at the outbreak of the war in 1914. The impossibility of obtaining the more up-to-date foreign writings as a close control of the proofs, resulted in the absence of some of these proofs. But they refer almost without exception to quite inferior and mostly insignificant aberrational or secondary species, so that they will hardly be missed.

We have willingly complied with the suggestion communicated to us from among the circle of subscribers, prior to the completion of the fourth volume, also to put to the synonyms the reference to the pictures. A double reference being saved thereby, we regret that this desire has not been made known to us before the table of contents of the earlier volumes was finished.

As the publications of new descriptions were very much facilitated on the issue of the separate chapters of the „Macrolepidopteras“ by the classification of what was already known, it was certain that within the well-nigh 8 years from the appearance of these 4 volumes, many new specimens, hitherto difficult to define, should be found and published. In order to instance one case, we may quote the profusion of the names of „*Parnassius*“ that have been enumerated since 1907 — the year in which this chapter appeared in the „Macrolepidopteras“. The danger, threatened in this way, by an obsolescence of the first volumes before the completion of the work, had been anticipated, and we intend to safeguard the work against this danger by an occasional edition of **supplementary numbers**, in which everything necessary to be known is to be supplemented in the text as well as by coloured plates, thus keeping the work always up to the mark. These supplementary numbers will appear in loose sequence subordinate to the productiveness of new discoveries of the different years.

As intimated in the introduction to the earlier volumes in a work which by all means must be looked upon as a first attempt as to its scope and arrangement, numerous defects are unavoidable. Many of them might only have been avoided by a more careful and slower elaboration of the prodigious material, whereby many faults would have been omitted and a more thorough penetration into the subject been produced. But we have, as emphasised again and again, not been desirous to admit a further rise of the price of the work

and its time of publication, and have sacrificed to the main object of the work — cheapness, quickness, completeness — many other qualities which might have been aimed at. Our intention was by no means to make the whole lepidopterological literature dispensable in every instance. But above all we wished to create a manual affording a quick and easy insight into the numerous collections, where to this very day often great treasures are lying dormant, unknown and unclassified. First and foremost, the museums ought to have an opportunity for arranging their collections, and make them available to visitors without burdening the officials with the wearisome labour of definition from borrowed authoritative works, for the scientific activity of these officials is required in another direction. The multifarious appreciative remarks sent to us in this respect have inspired us with the hope that some gaps which this work cannot be exempt of, will be leniently dealt with.

So as to incite a tendency to indulgent criticism in those who think the work has not come up to their expectations, we have endeavoured to surpass what had been promised by us with respect to the illustrations. This has not only been done by the increase of the figures from 10 000 to 12 000, but above all by putting in place of the three-colour process plates as promised in the prospectus, much more valuable and elaborate lithographic plates. Through the favourable reception the work found at its publication, the publisher, of course, in foregoing the profits in view for him, was permitted to produce the much dearer lithographic plates instead of the more schematic and cheap ones attached to the prospectus. The utility of the work has been considerably increased by this additional performance, and we request to take this as a compensation for those cases in which some pictures may be looked upon as somewhat of a failure in their execution. The unexceptional faultless turning out of 12 000 illustrations is beyond an attainable limit. Nor do the main objects of the work mentioned above admit the production of something that is fully unobjectionable from an artistic point of view. With a sufficient distinctness of the illustrations, we have looked upon our task as solved, and even deemed it useful, when a great choice of the models is in view, not to choose for reproduction particularly large and uncommonly beautifully developed animals, but have throughout stuck to average specimens, of which we could assume they would mostly resemble those that were casually compared with them. But, in opposition to certain critical utterances, we beg most emphatically to state herewith that in this process we see an advantage and not a disadvantage of our work as a manual.

With the completion of the palaearctic part an acceleration in the publication of the exotic numbers might have taken place, but for the sheer impossibility of intercourse with foreign countries, together with the great interruptions by the blockade of Central Europe, which rendered the furtherance of the work in every respect difficult. But for all that it was possible to bring the first great main division of the Exotics and the treatment of exotic *Rhopalocera* almost to a close. Only the completion of the *Lycaenides*, which are now in print, is still wanting. Besides the *Grypocera* could also be prepared and begun, and the *Heterocera* could be advanced in both the American and Indo-Australian division. But the collection of materials for the supplementary numbers of the principal part terminating with this volume, could also be begun, and unless new convulsions in the political life of the European continent thwart the designs elaborated, we feel confident to be able to finish the missing parts of the complete work in a short time.

We have been confirmed in this belief by the favourable reception the present volume has found in its German edition. From no part of the public we have heard an averse comment, but the elaboration of the *Geometrides* was, with respect to its uniformity pointed out to us as the most successful portion of the whole work. Mr. L. B. PROUT, the author of the work who, in spite of the very narrow limits allowed as to space, succeeded in the exhaustive treatment of the abundance of forms in the family of *Geometrides*, has received his well-earned share of admiration from the public. But we also owe thanks and appreciation to the publisher who, notwithstanding the great disturbances in the political situation of the world, and the increase of expenses, was not restrained from bestowing the same care upon the getting up of the work as upon those earlier volumes brought to a close while peace was yet prevailing.

Moreover I should also like to give thanks to all of them who, by written communications or loans of originals and aberrations, made a completeness in the illustrations of this volume possible, a completeness not inferior to that of the former volumes. Above all the supply of numerous models is owing to the author's care and the guidance, which he gave to Miss PROUT in the production of them.

I should likewise render thanks to the collectors who, through loans of originals and aberrations, have made a completeness in illustrating the present volume possible, which completeness is in no way inferior to the former volumes. The supply of models for the illustration is particularly to be ascribed to the care with which the author guided and directed the artist, Miss PROUT, in the production of them.

The very valuable collaboration of my assistant, Dr. Josef Schramm, has, I am sorry to say, been brought to a sudden end at the outbreak of the war. Wounded at the beginning of the war, he was but a short time absent from the battlefields, and died a hero's death for his country as an Austrian officer of reserve on February 23rd. Beside this indefatigable collaborator, I should also express my thanks to the late Oberrechnungsrat Zdenko Zalezny of Brünn, for having taken the trouble to point out a great number of irregularities in the citation and denomination of the plates, which shortcomings could be amended in the „Rectifications“.

Darmstadt, October 1920.

Dr. ADALBERT SEITZ.

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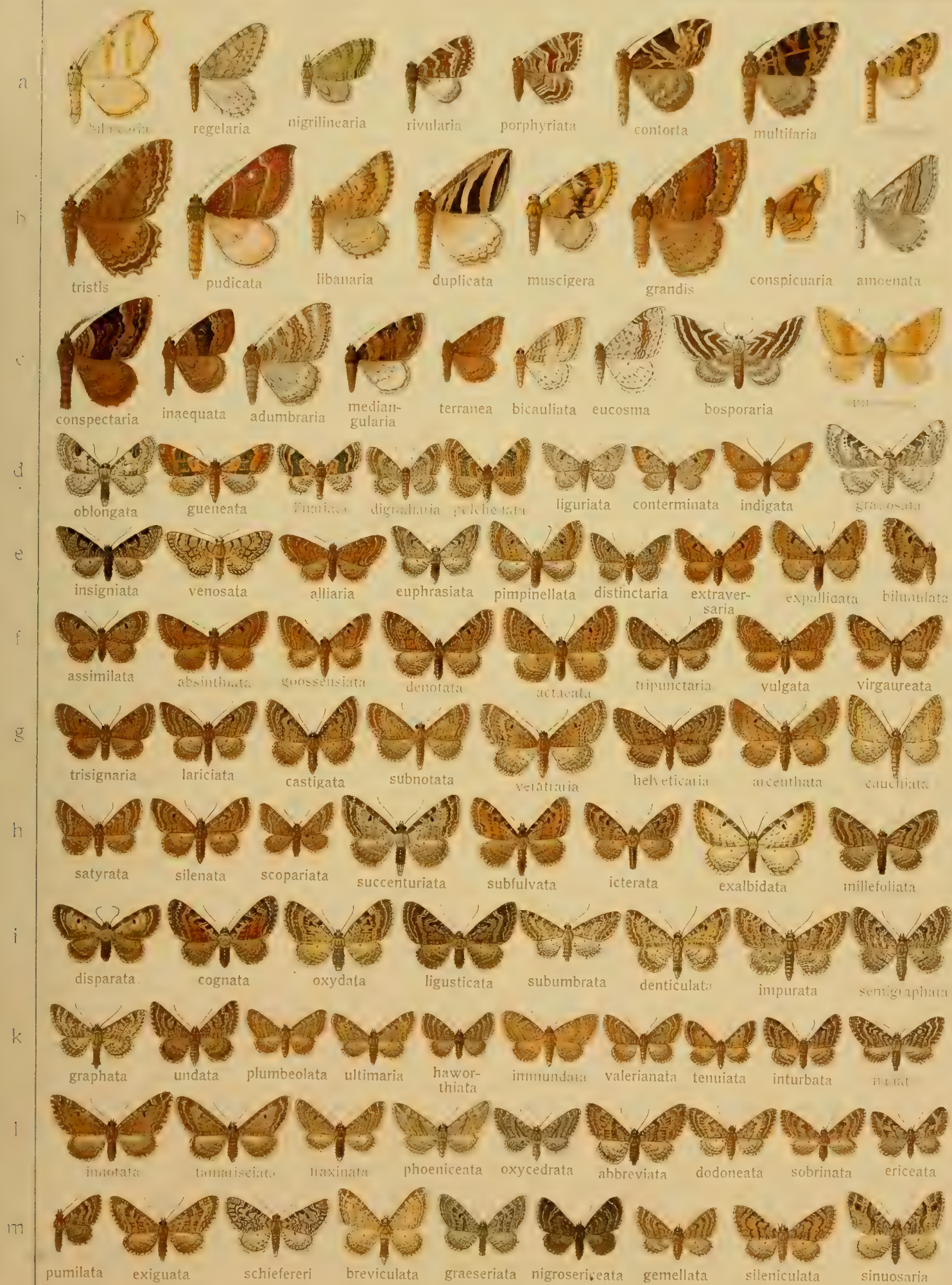






































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